



# **Armed Forces College of Medicine AFCM**



# **Nose and Paranasal Sinuses**

**By**  
**Ass. Prof. Dr.: Hussein Mohamed**

# INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

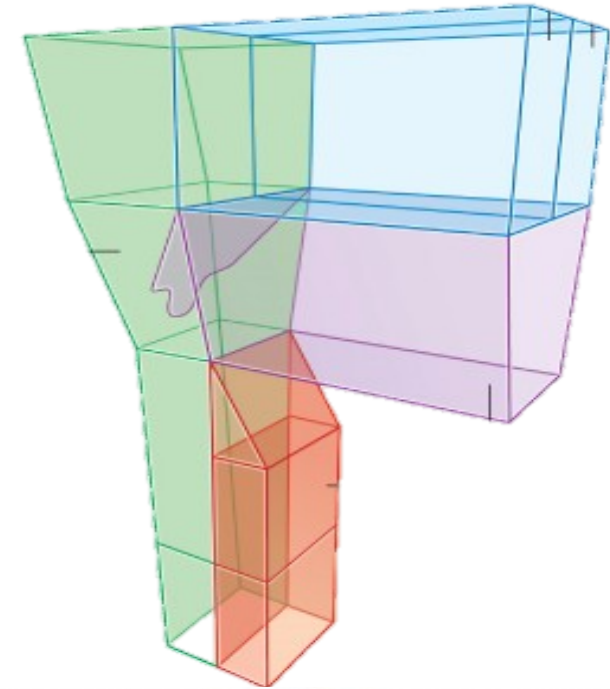
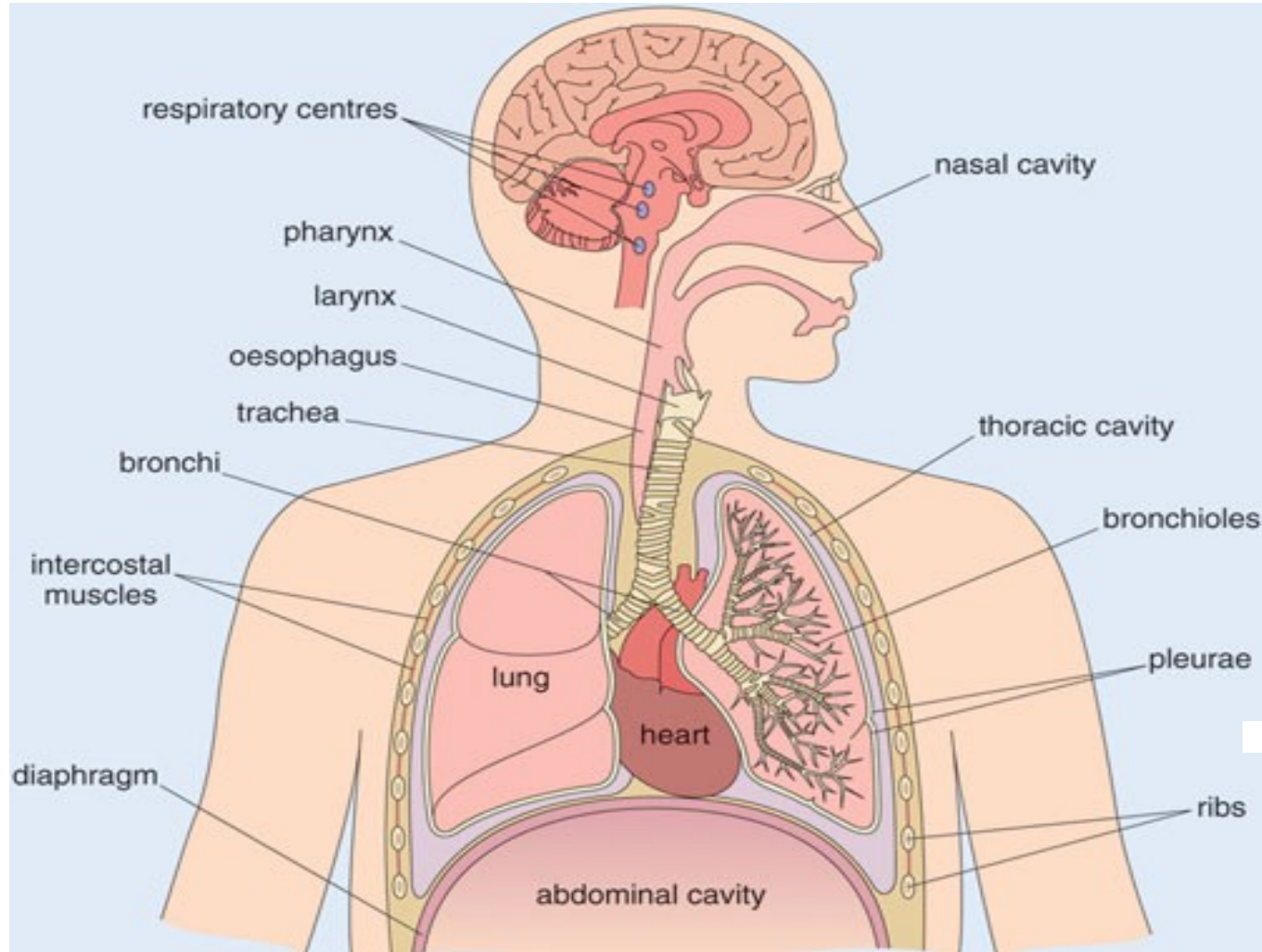
1. Identify the boundaries of nose.
2. Identify bone forming the roof, floor , medial and lateral walls of the nose
3. Describe the features of lateral wall of nose
4. Locate the site of the paranasal sinuses
5. Identify the sites of opening of the paranasal sinuses.
6. Explain the applied anatomy related to paranasal sinuses

# Lecture Plan



1. Part 1 (5 min) Introduction to respiratory system
2. Part 2 (35 min) nose & paranasal sinuses
3. Part 3 (5 min) Summary
4. Lecture Quiz (5 min)

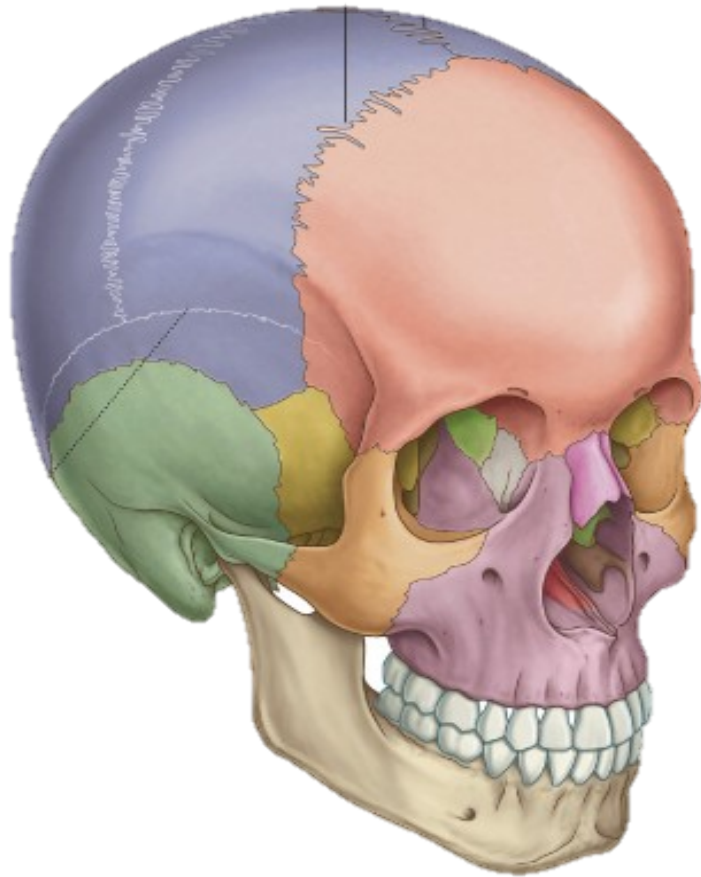
# Anatomy of respiratory system



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**WHAT DO YOU  
THINK ABOUT  
THIS CUBES?**

# Summary of bone of skull



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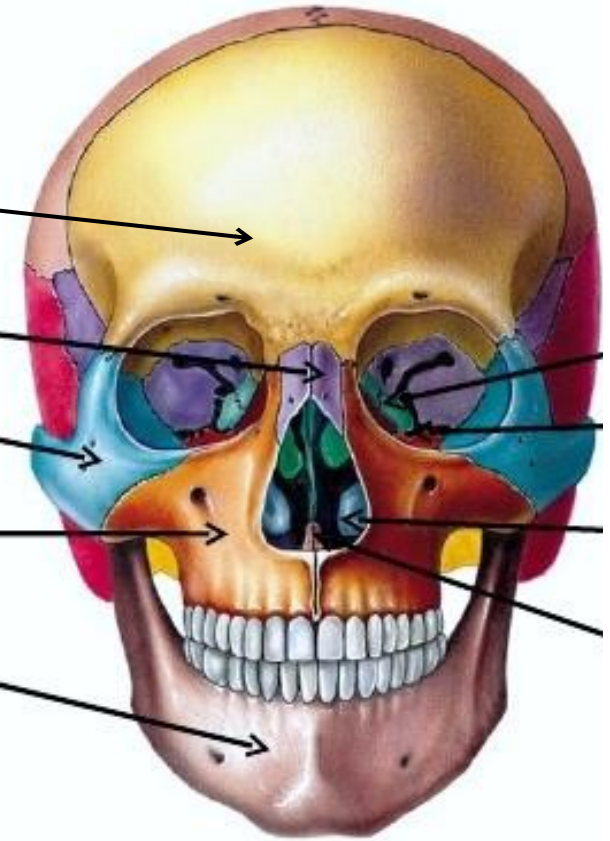
- Frontal

- Nasal

- Zygomatic

- Maxilla

- Mandible



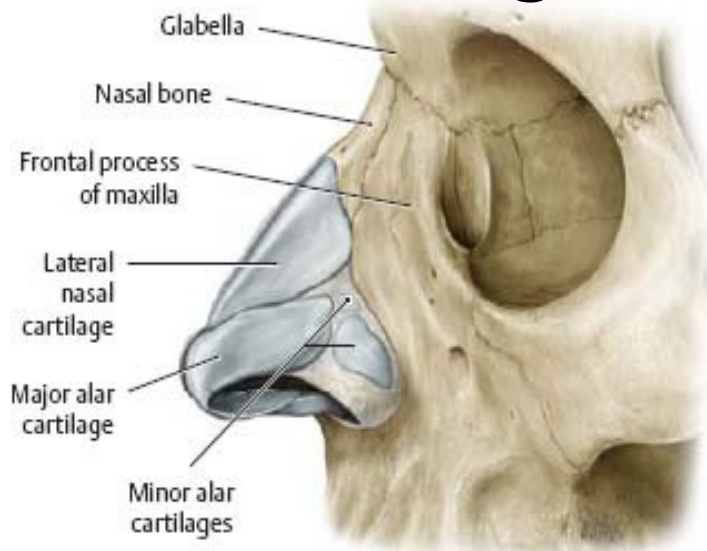


# External Nose

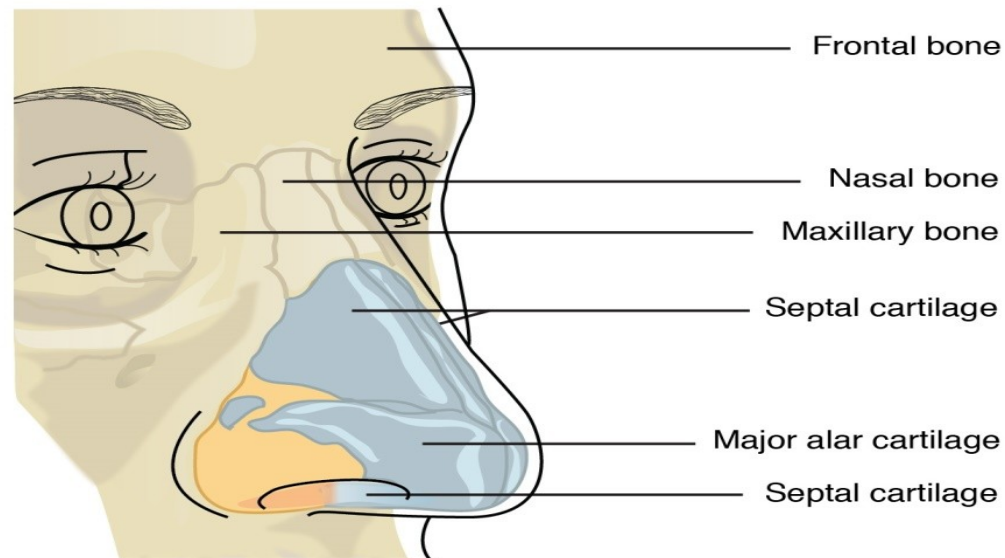


Its skeletal framework is formed by:

The ***nasal bones + frontal processes of maxilla & the nasal cartilages.***



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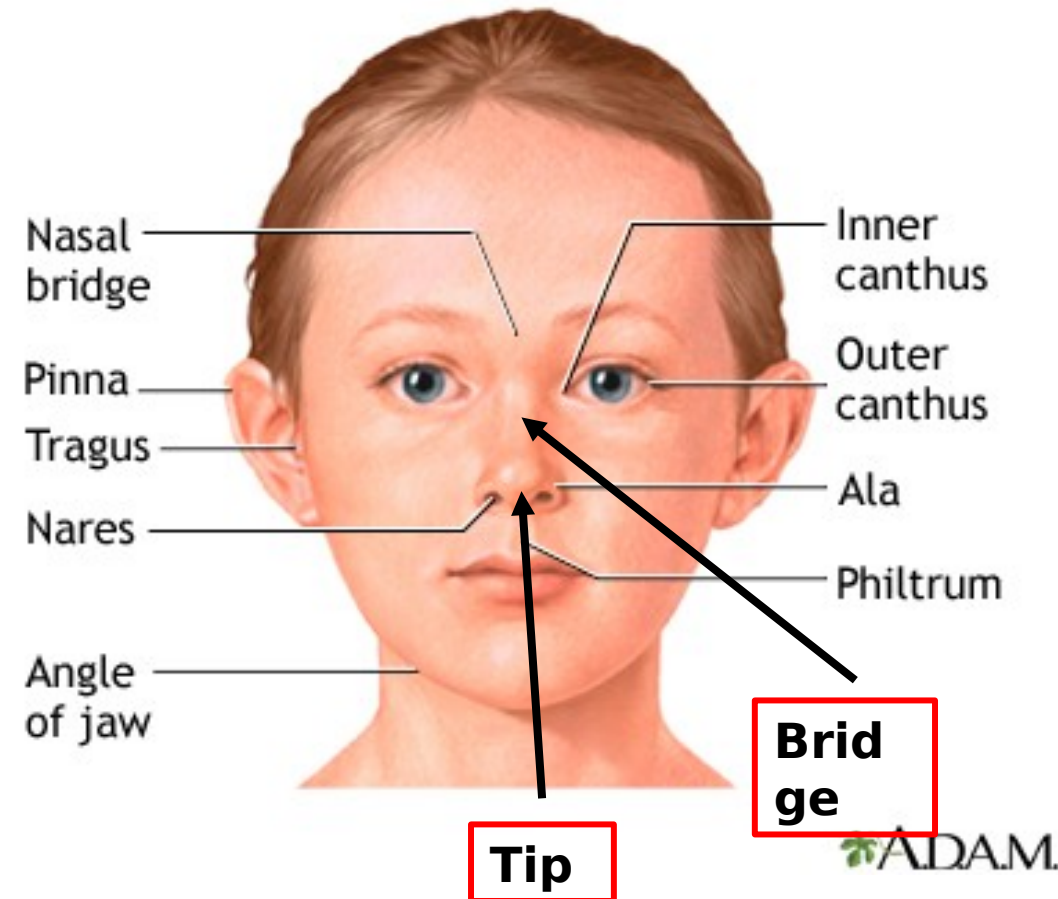


Cardio-pulmonary Module

**Bony part**  
**cartilagenous part**

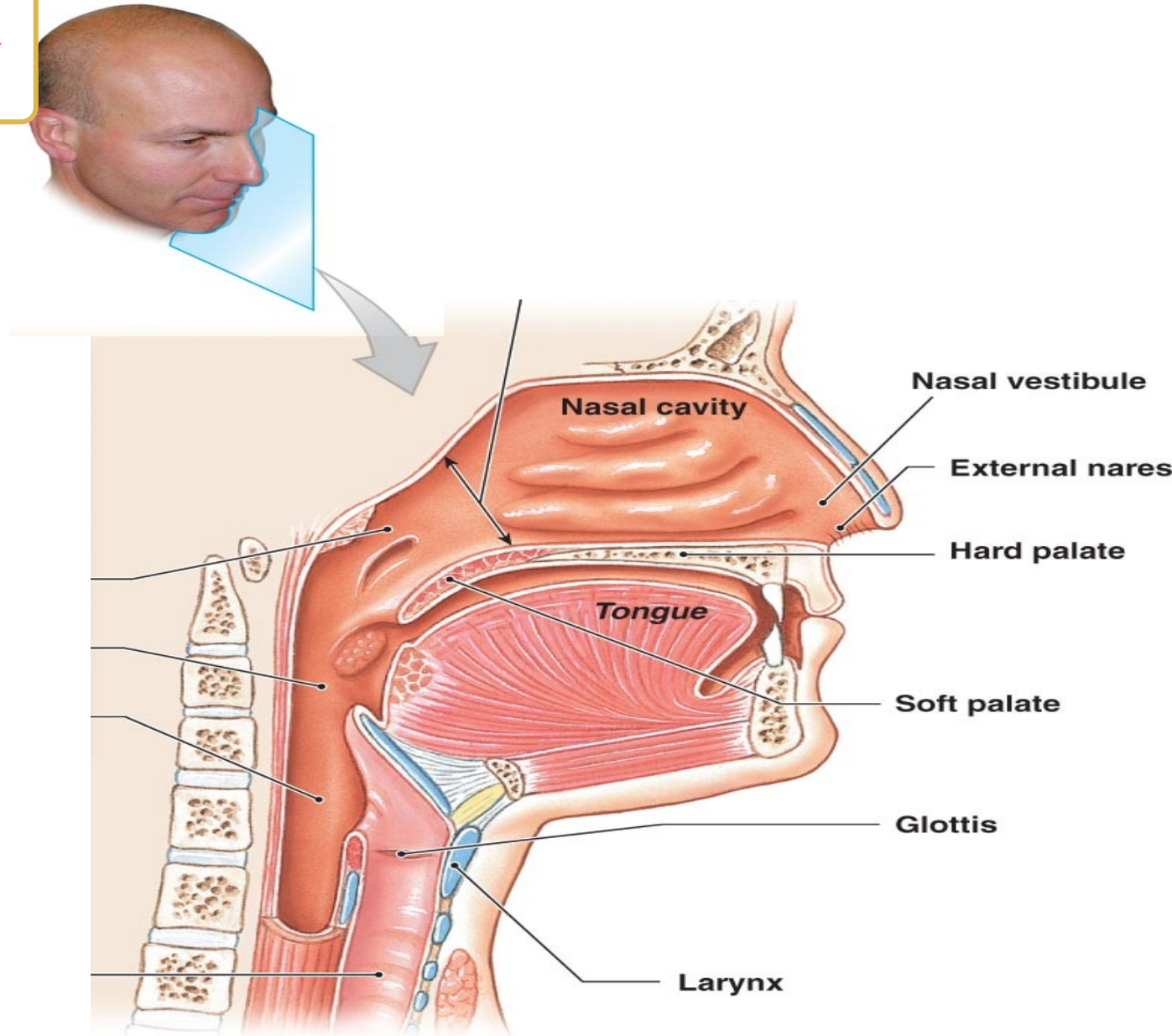
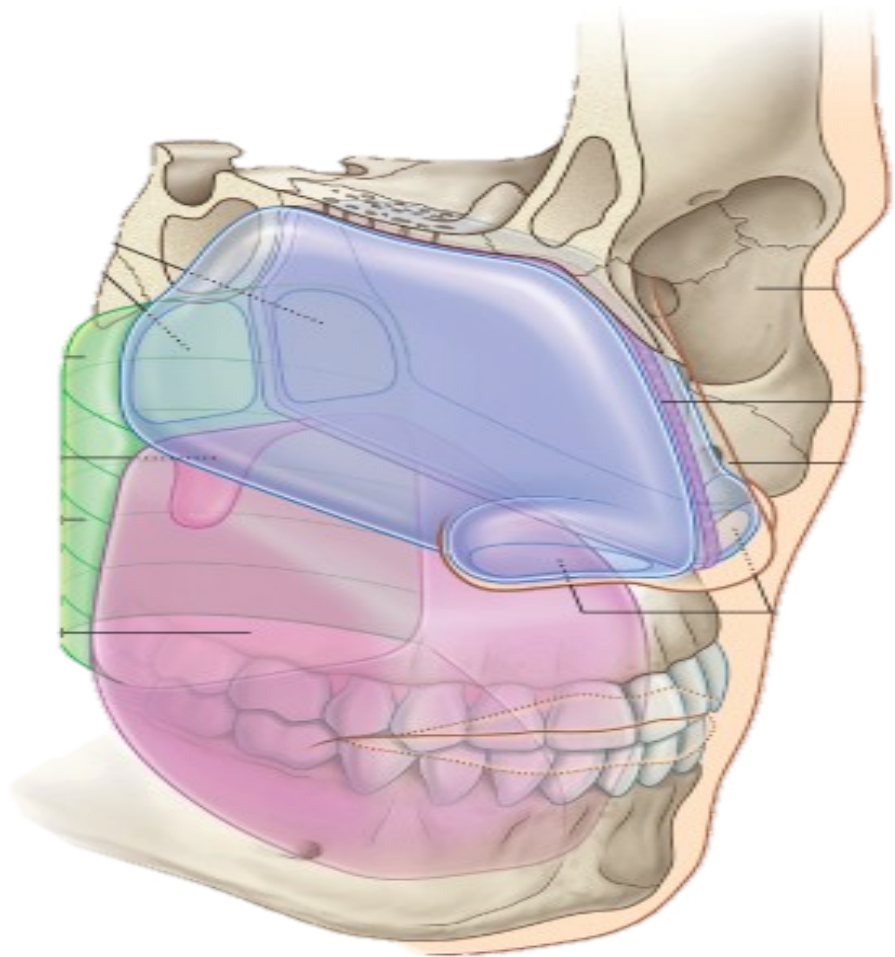
# External Nose

- - It has a **bridge**, **tip**, **nares** (*nostril = anterior opening of nose*) and **ala** of nose which bounds the nostril laterally.





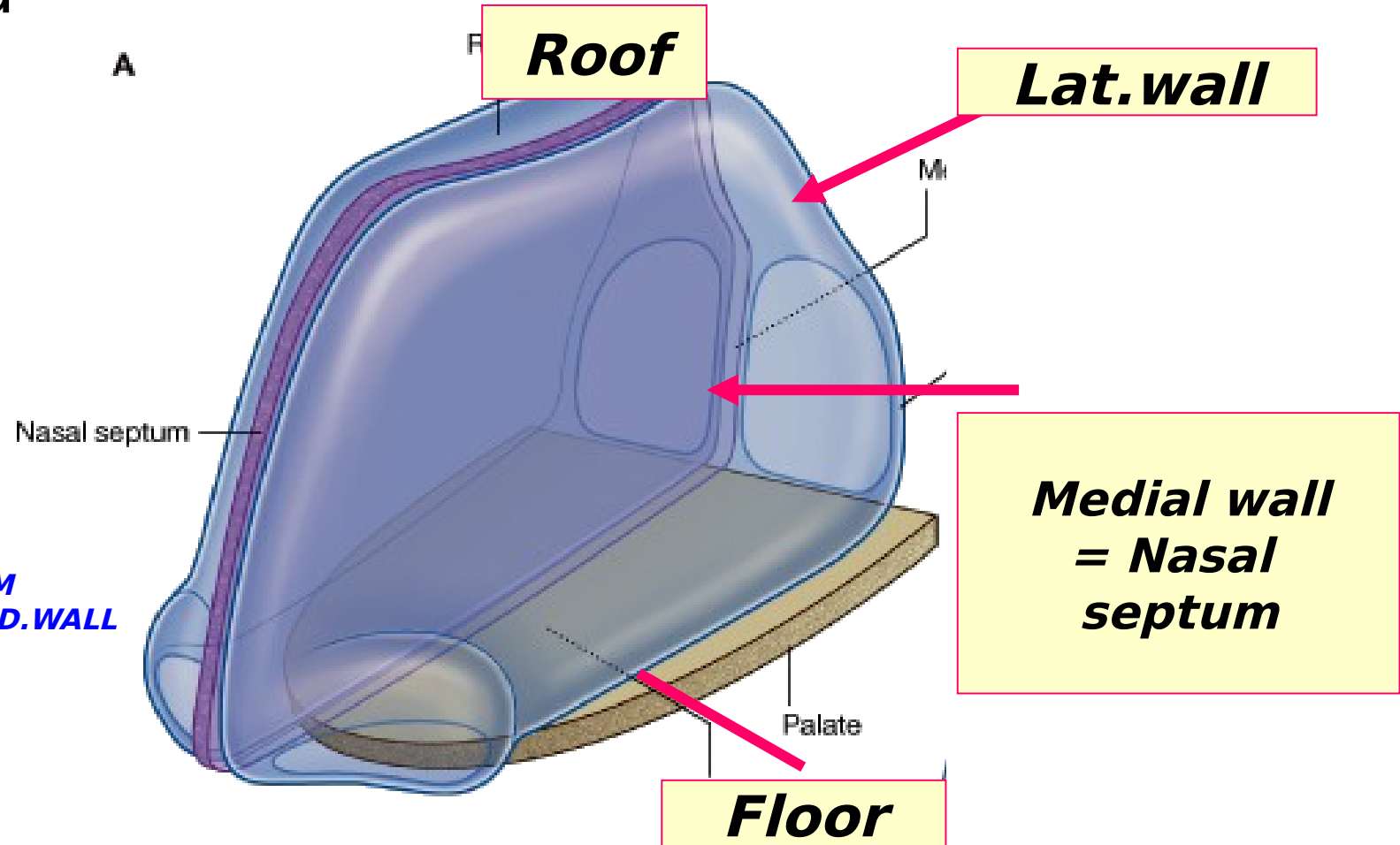
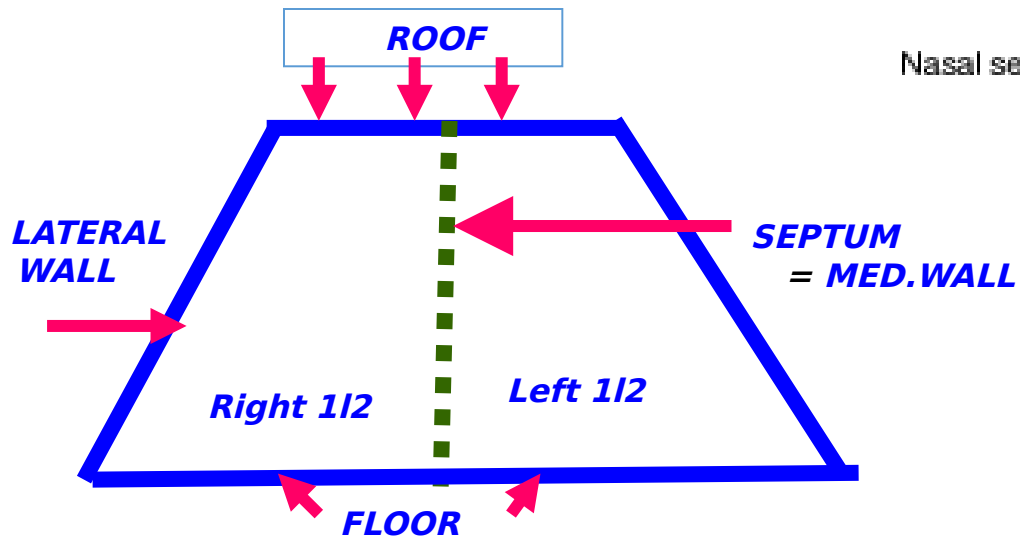
# *The nasal cavity*



# *The nasal cavity*

Each nasal cavity has a

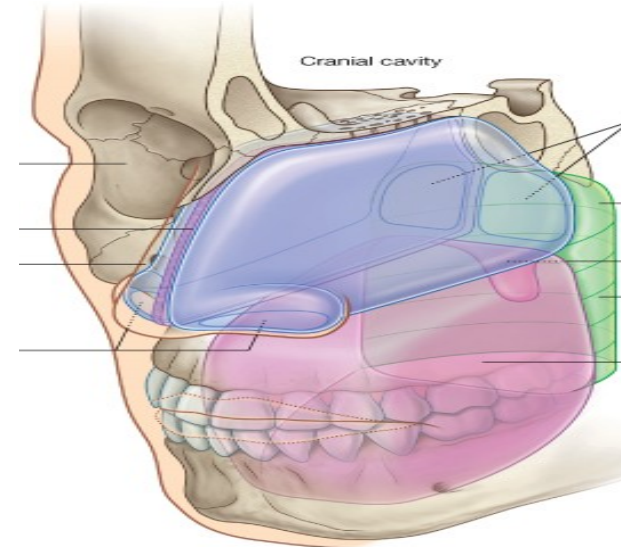
- ✓ Floor
- ✓ Roof
- ✓ medial wall
- ✓ lateral wall



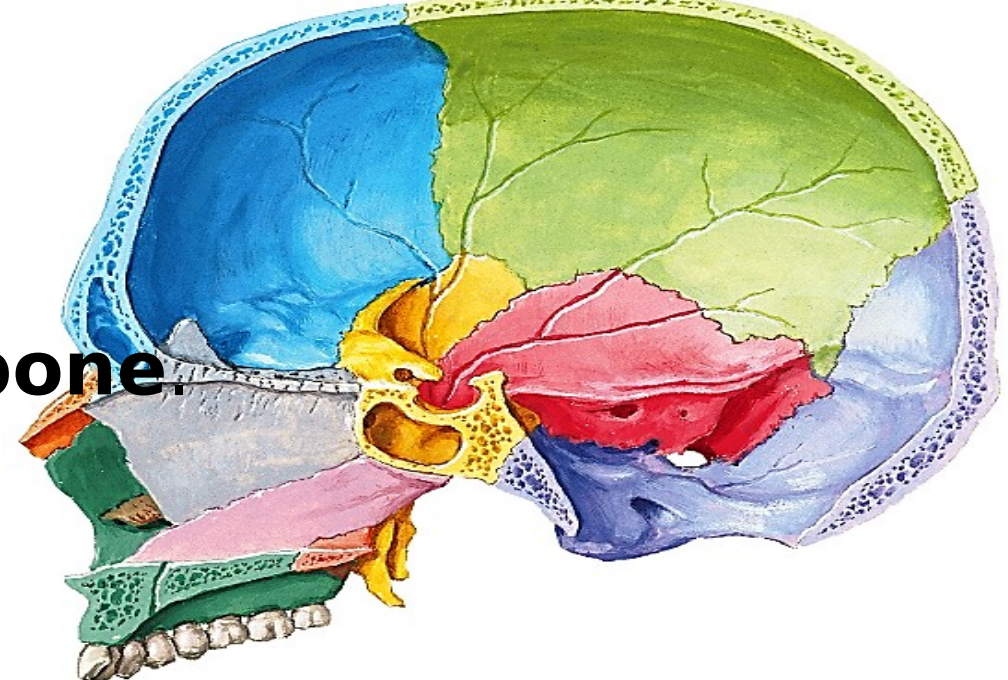
# *The nasal cavity*

## ❑ **Roof**

- Separate the nose from the cranial cavity
- Formed by:
  1. Ant. sloping part:  
**nasal** and **frontal** bones.
  2. Middle horizontal part:  
cribriform plate of **ethmoid bone**.
  3. Post. sloping part:  
body of **sphenoid bone**.



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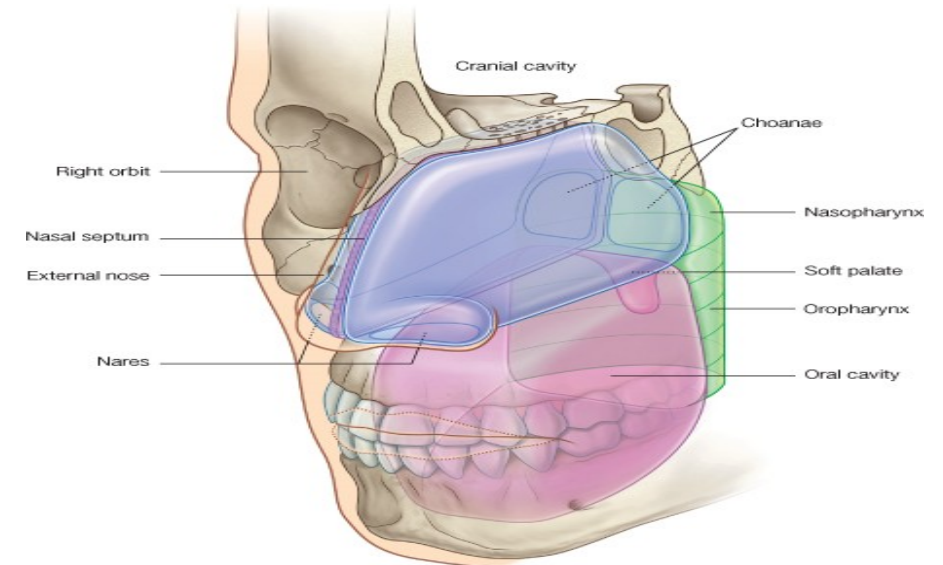
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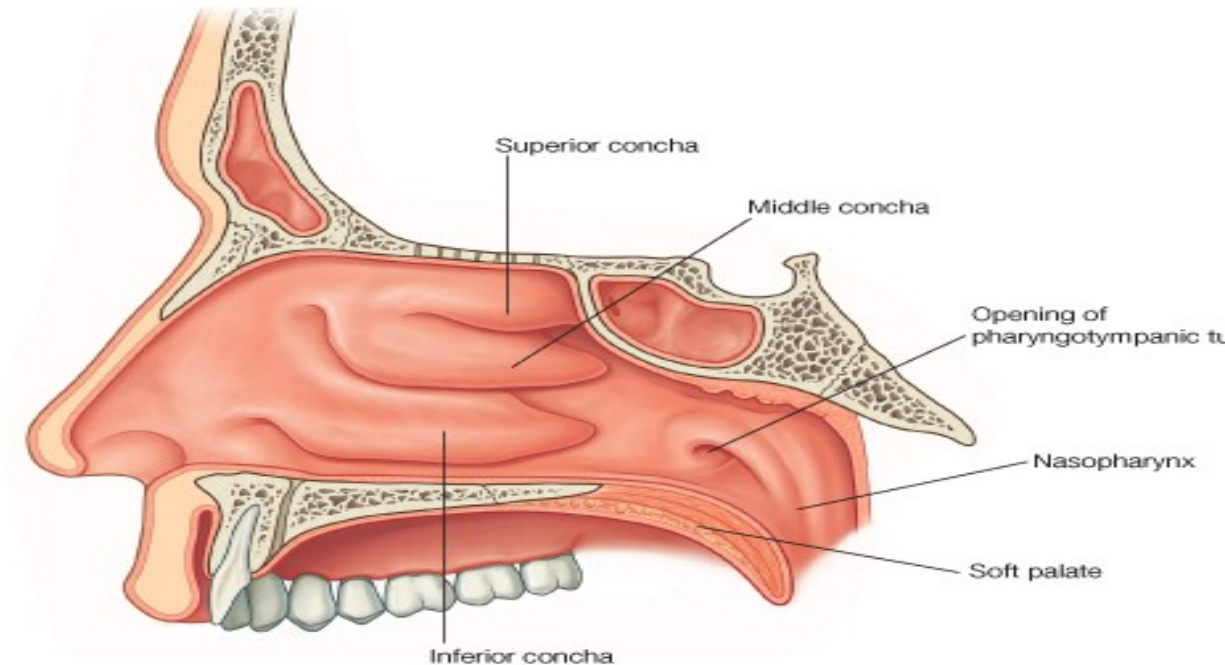
# *The nasal cavity*

## □ *floor*

- Formed of the **palate**  
(Hard palate)
- Separate the nose from the oral cavity



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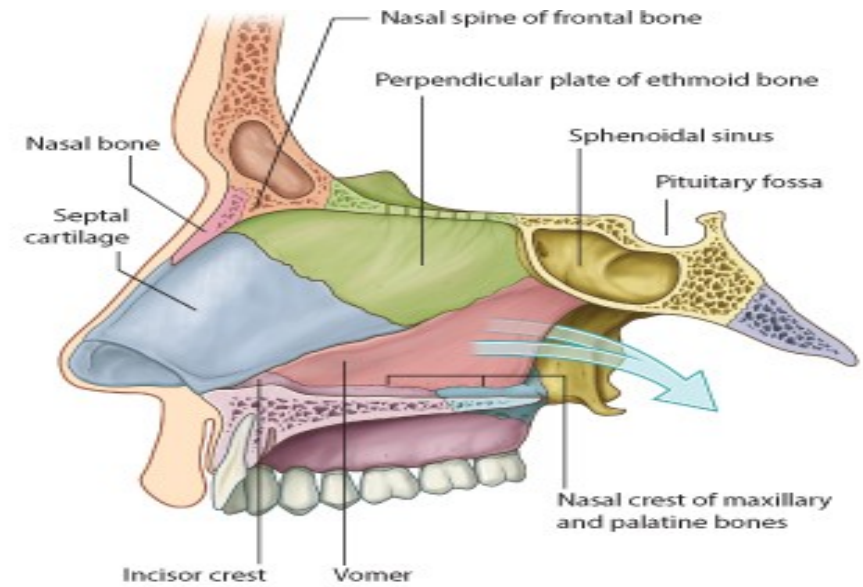


# ***Medial wall***

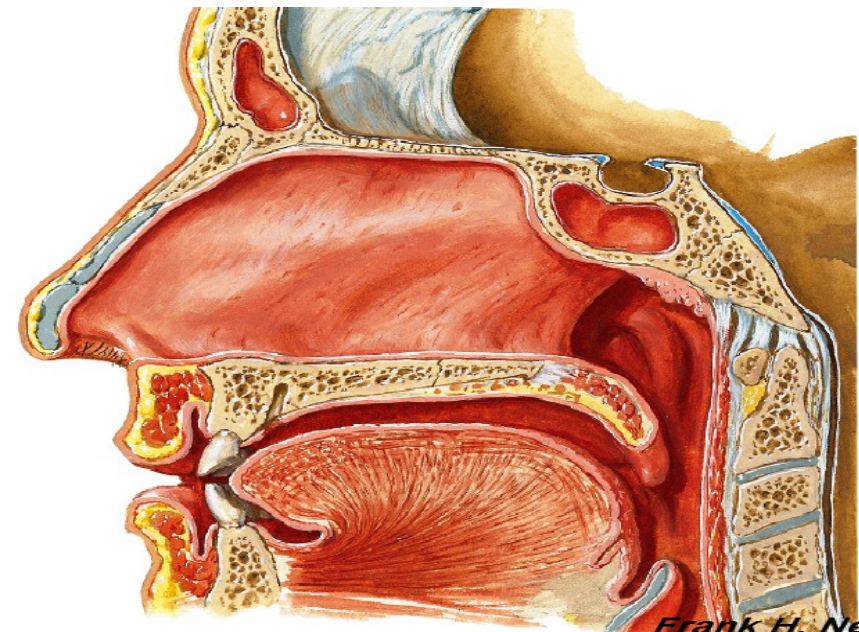
It is called  
**Nasal septum**

Formed by:

- Superiorly by the vertical (perpendicular) plate of ethmoid bone.
- Posteriorly by the vomer bone.
- Anteriorly by the septal cartilage.

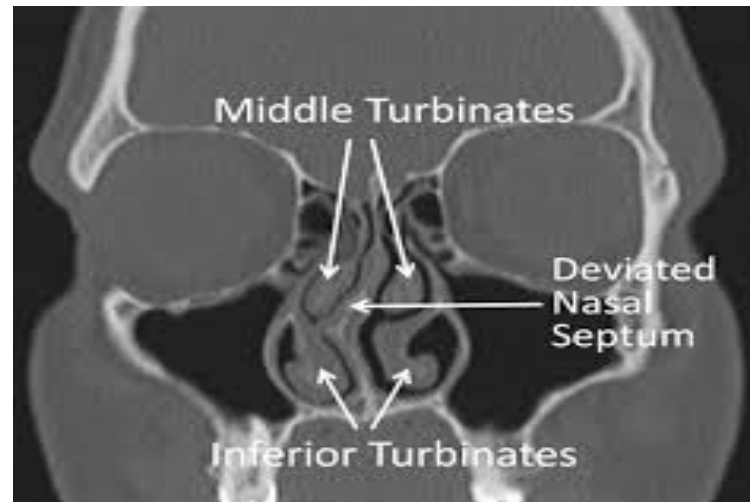
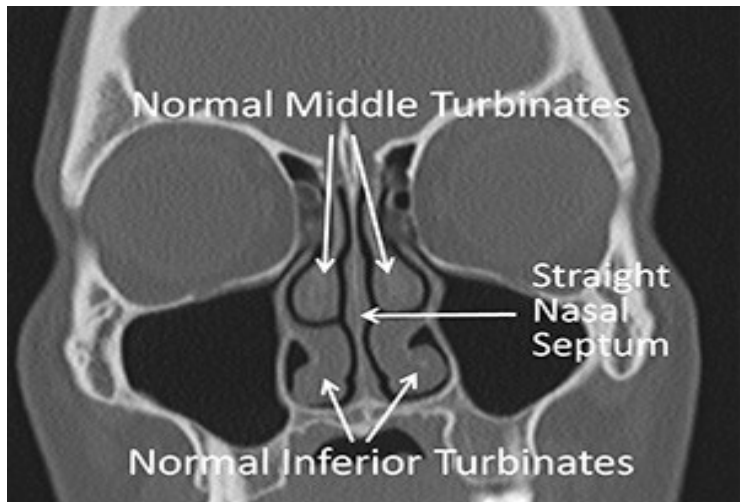
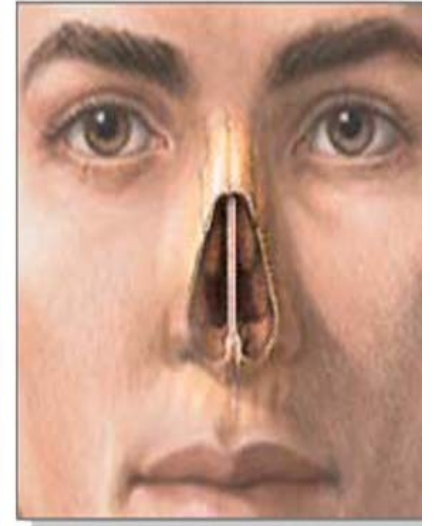


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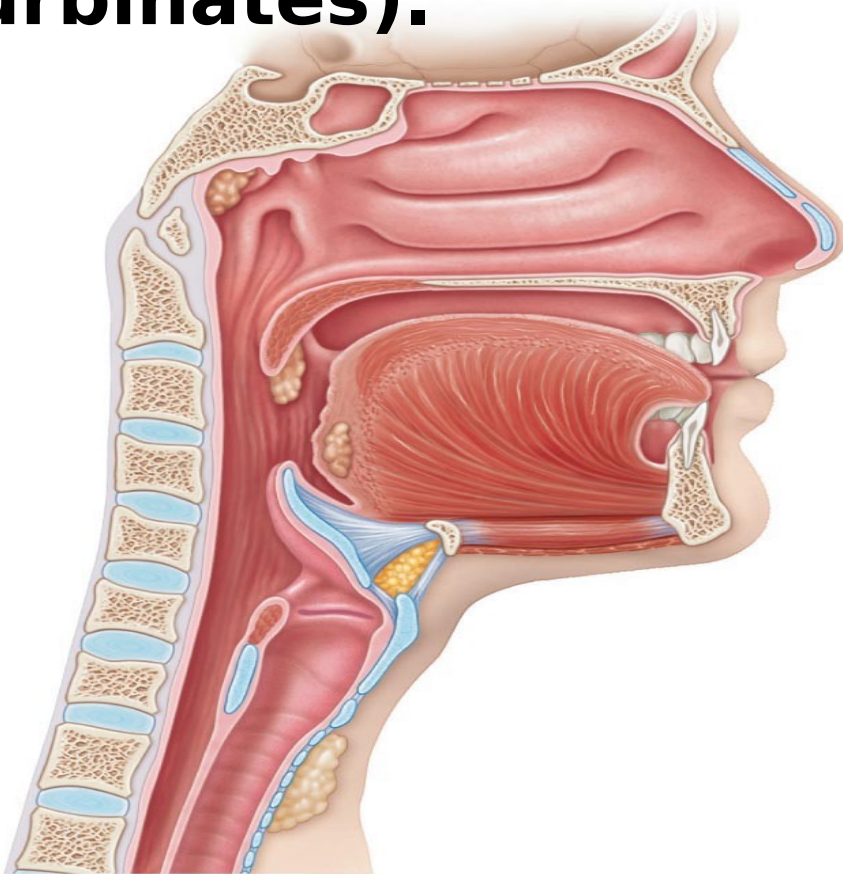
# ***Identify the abnormality?***





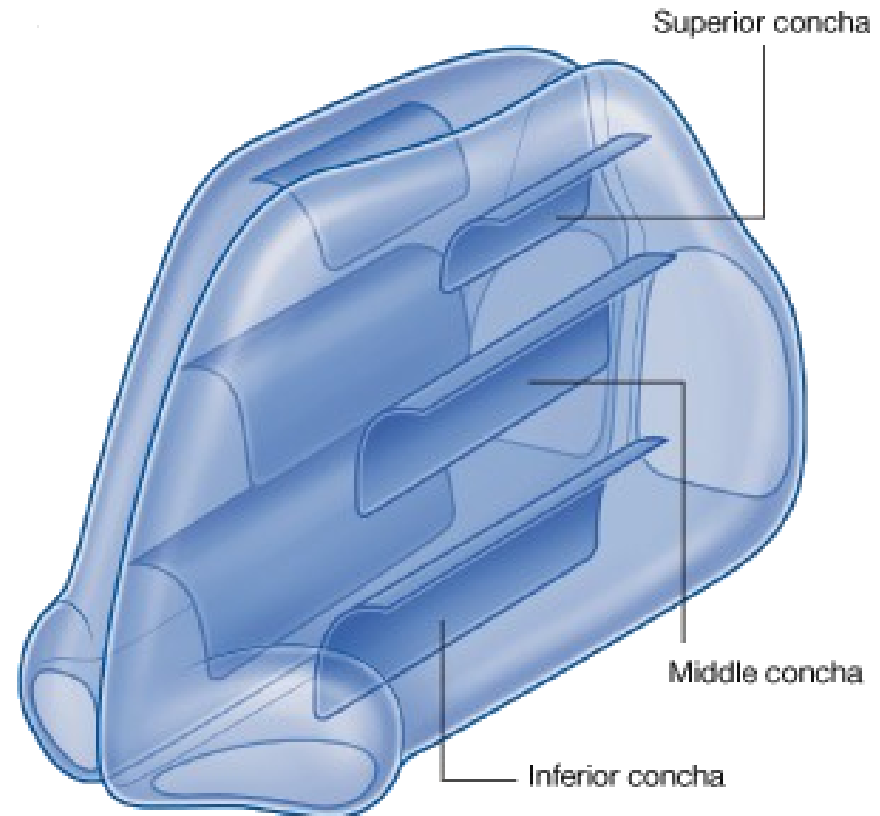
# ***Lateral Wall***

- has three curved shelves of bone.
- They are called **conchae** = **(turbinates)**.



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Cardio-pulmonary Module

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## ***Lateral Wall***

There are three curved shelves of bone.

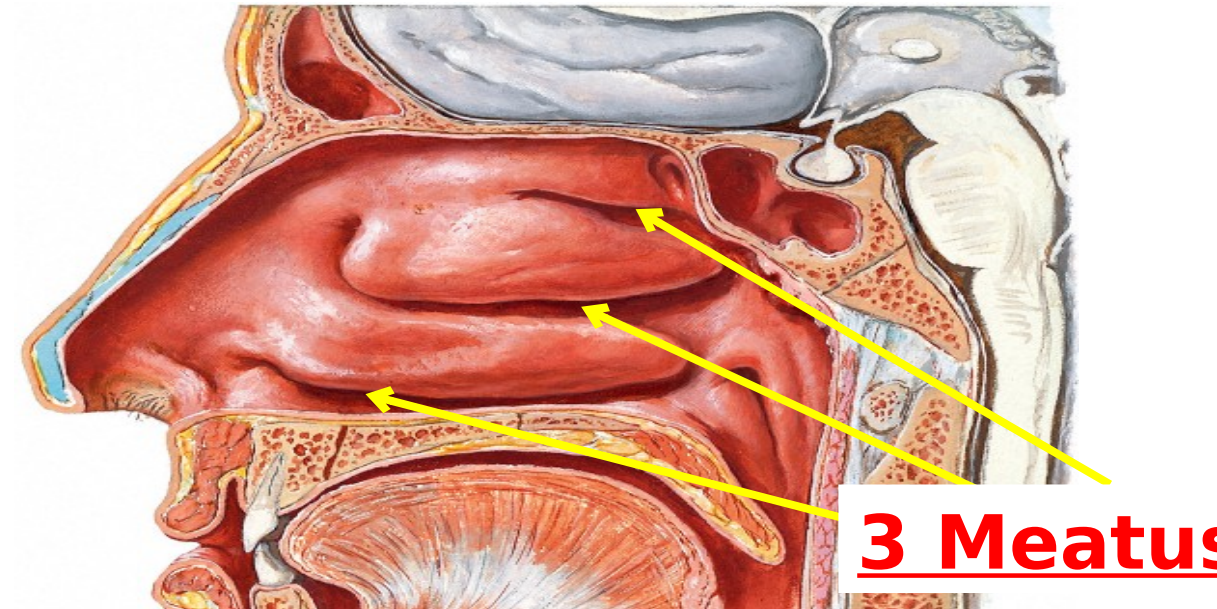
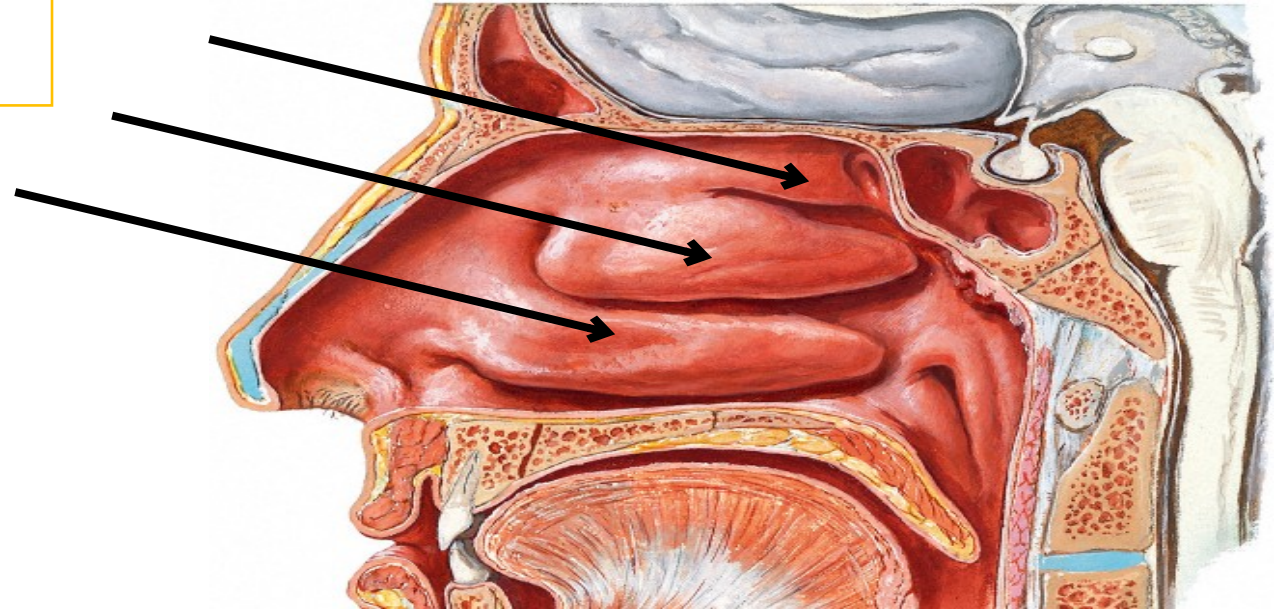
### **Conchae**

- I. Superior concha
- II. Middle concha
- III. inferior concha

There are **bony depression** under these projections

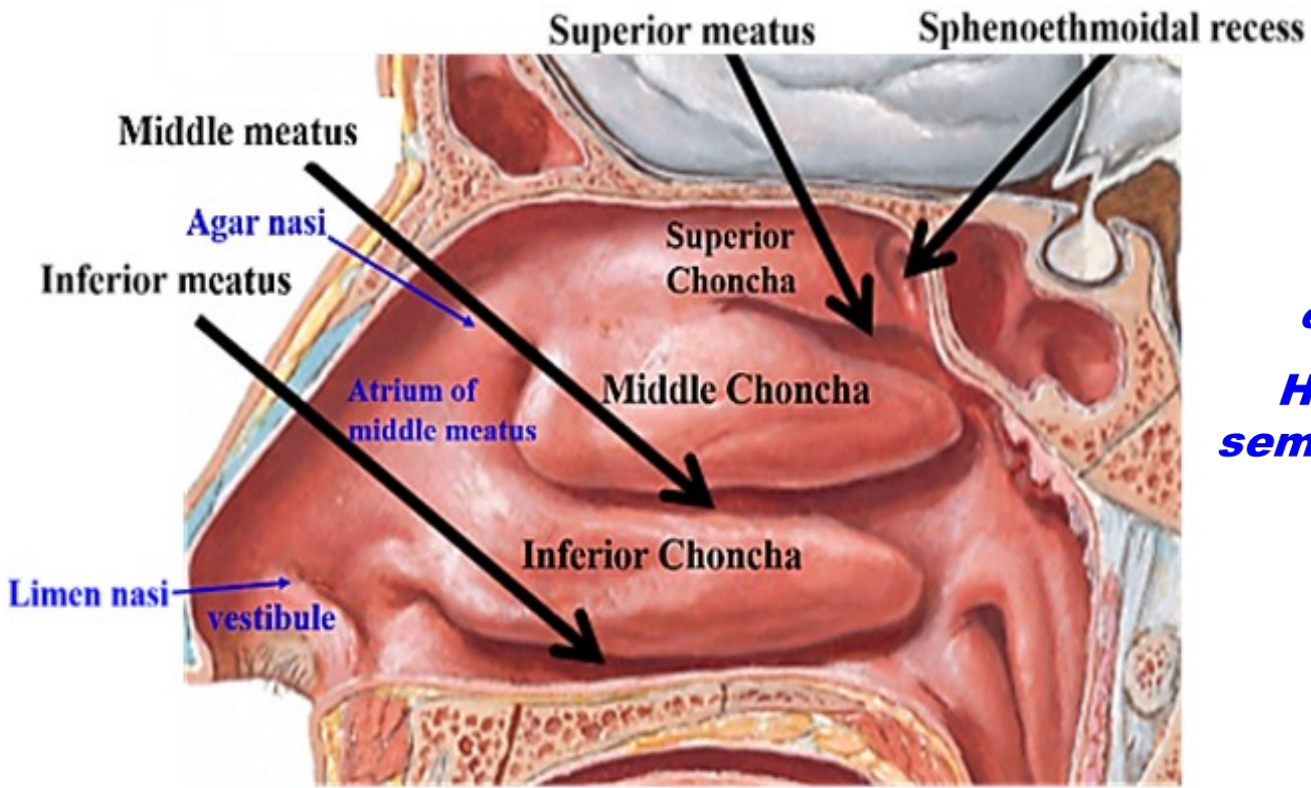
### **3 Meatus**

- I. Superior Meatus
- II. Middle Meatus
- III. inferior Meatus

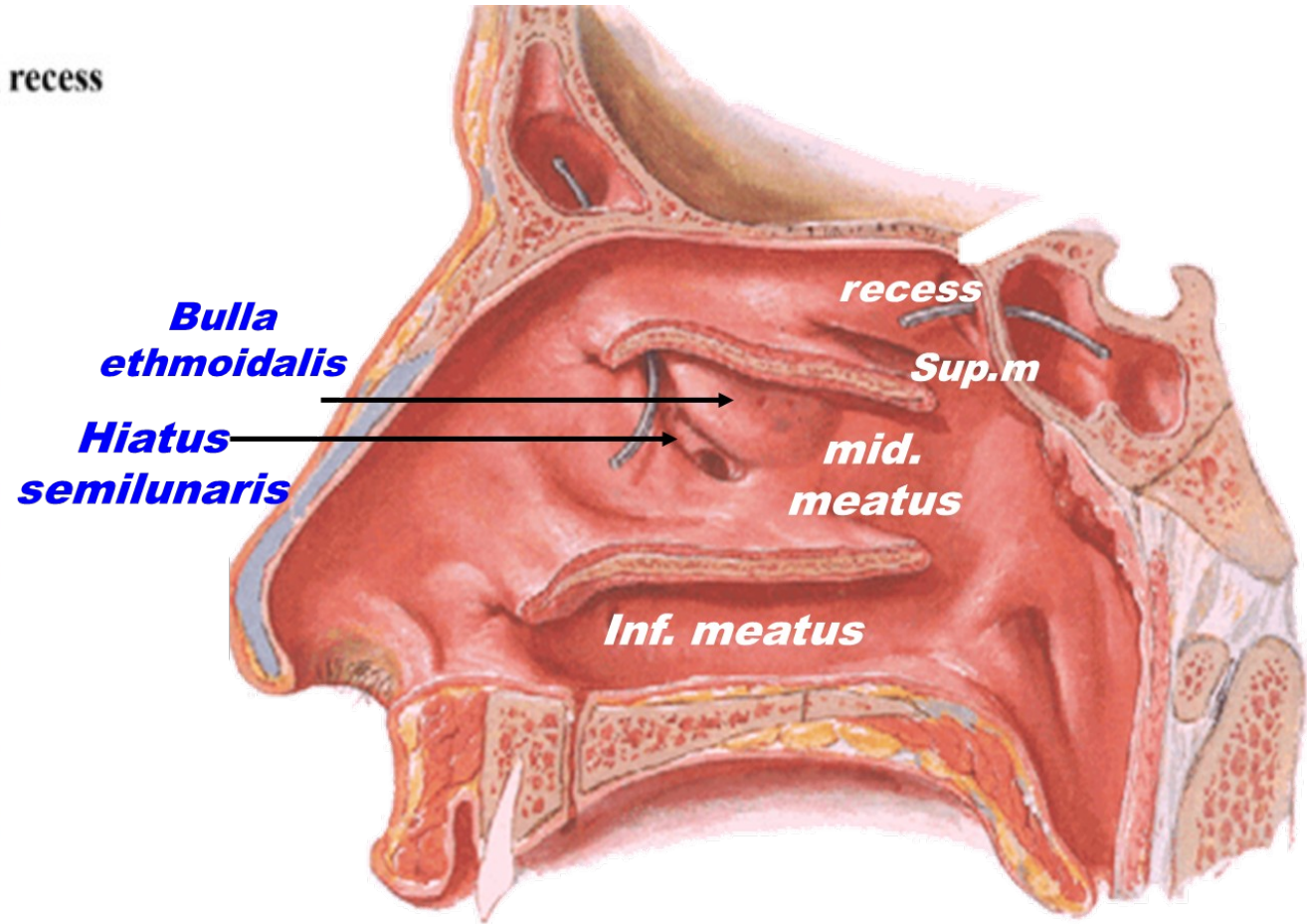


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**A young male has received a hard blow to his nose. The x-ray showed fractured perpendicular plate of ethmoid bone. Do you think which part of the nose will be affected?**

- a. Roof
- b. Floor
- c. Medial wall**
- d. Lateral wall

***Impaction of Foreign Bodies in the  
Nose is easy or rare?***

## **Foreign Bodies in the Nose**

are common in children. The presence of the nasal septum and the existence of the folded, shelf like conchae make impaction and retention of balloons, peas, and small toys relatively easy.





# Sinus Headache ??

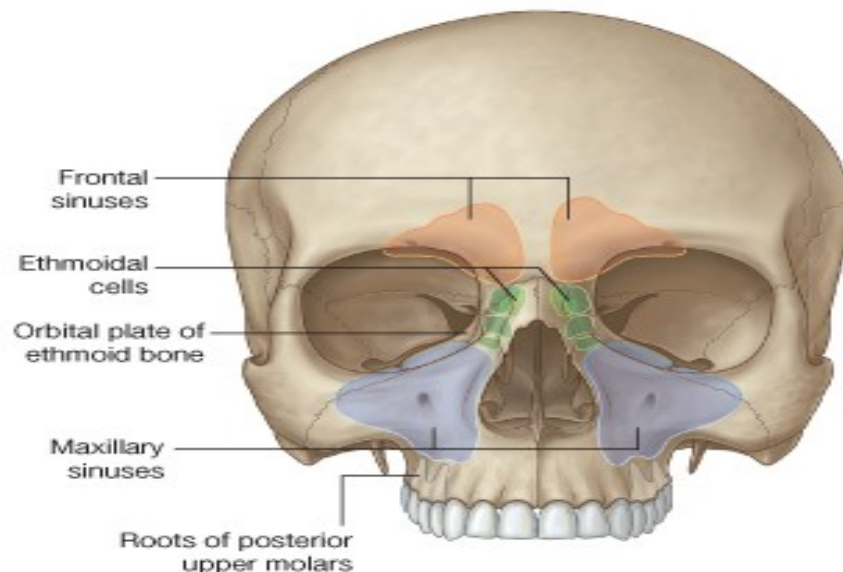
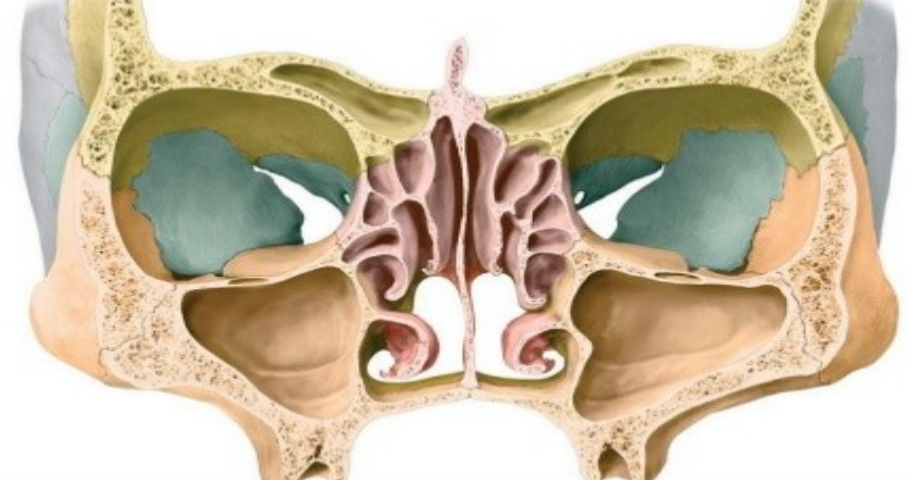


# Paranasal Air Sinuses

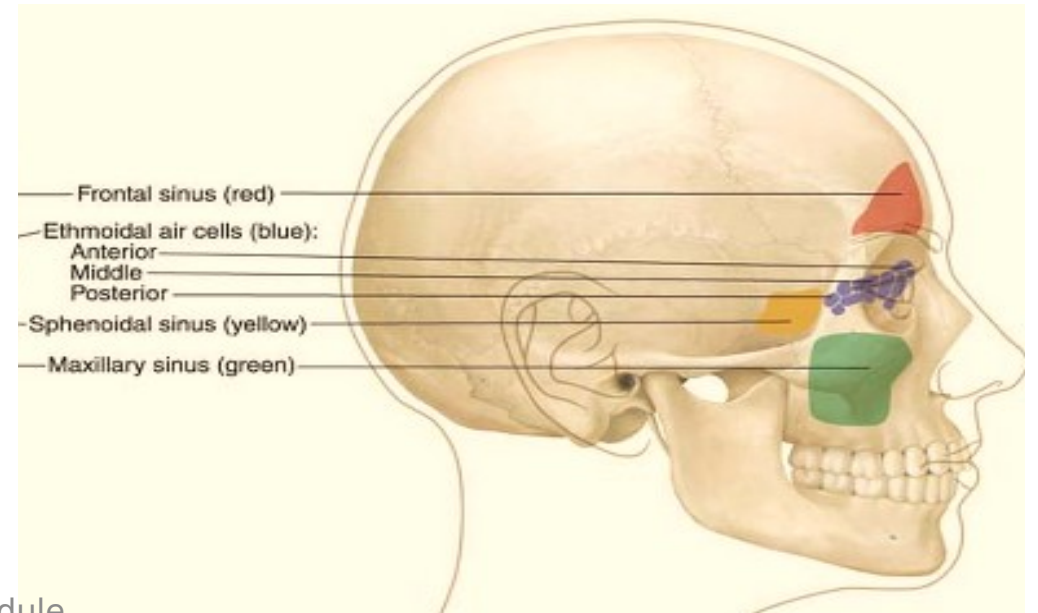


## Definition:

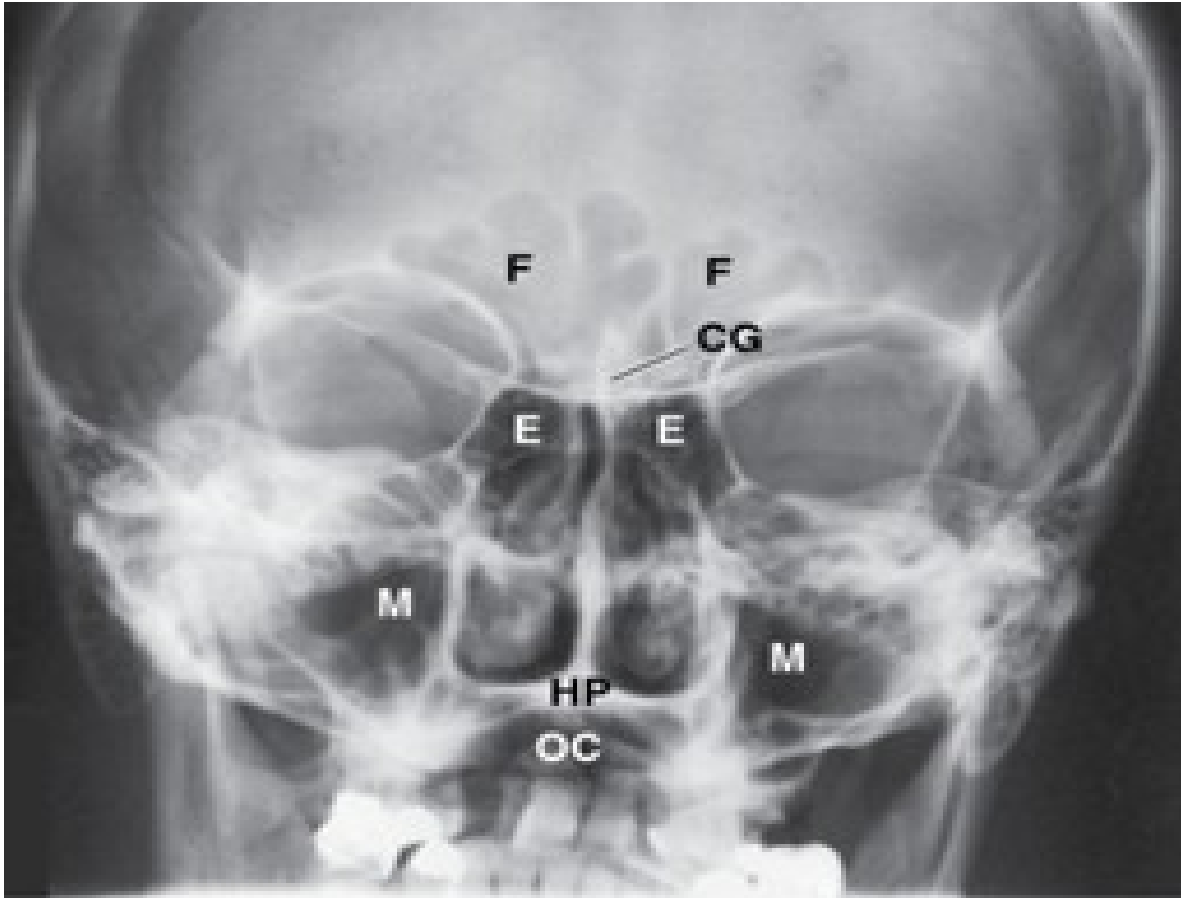
These are air-filled spaces located inside the skull bones around the nasal cavity, named according to the bones they are located in.



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# Paranasal Air Sinuses



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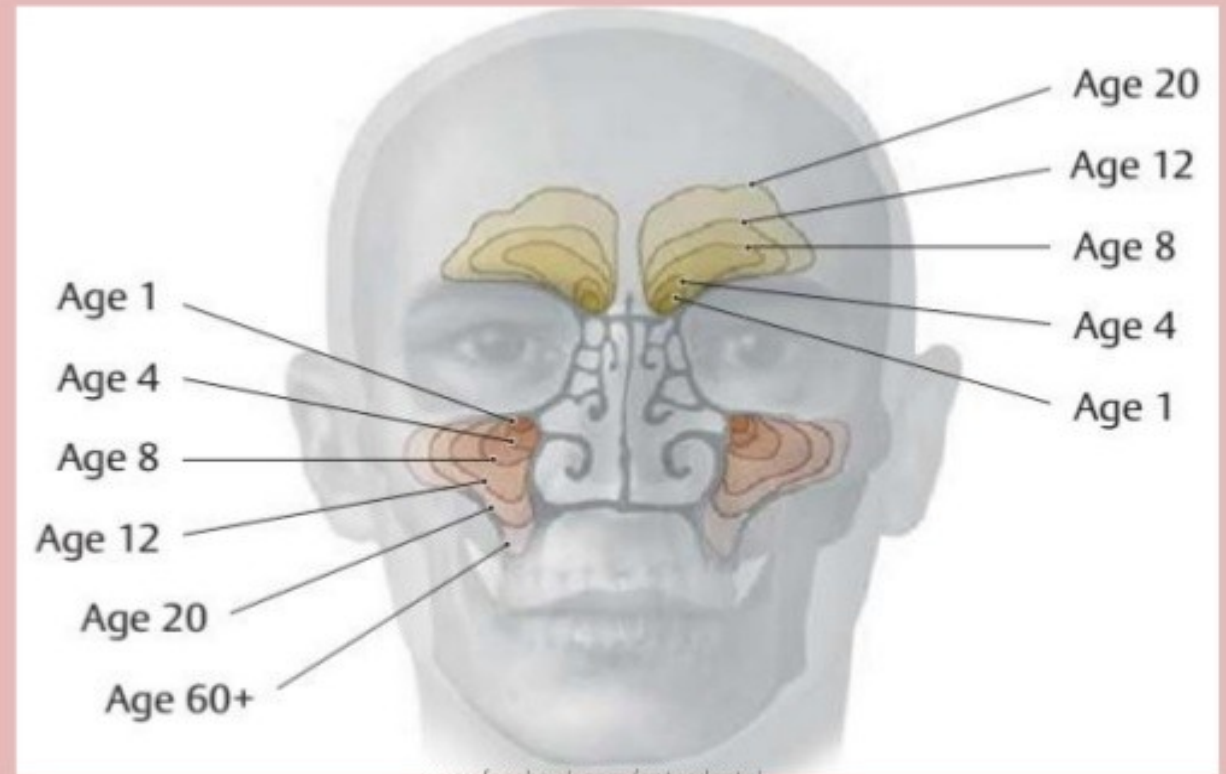


# Paranasal Air Sinuses



**At birth:**  
**They** are either present or small in size or they may be absent. They are fully developed in adolescence.

## PARANASAL SINUS



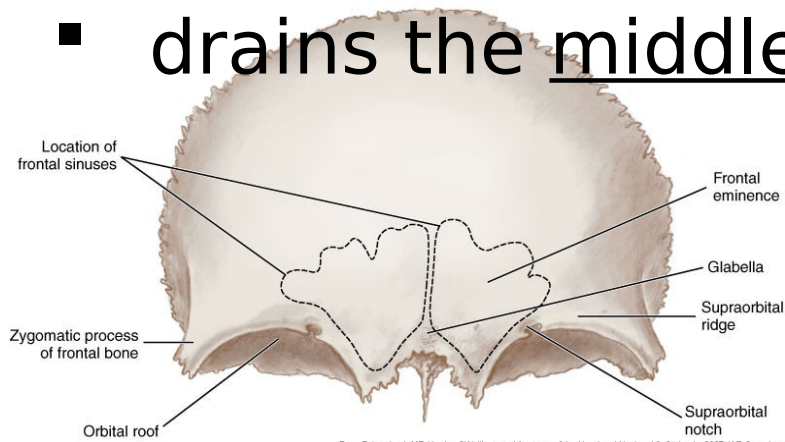
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# Paranasal Air Sinuses

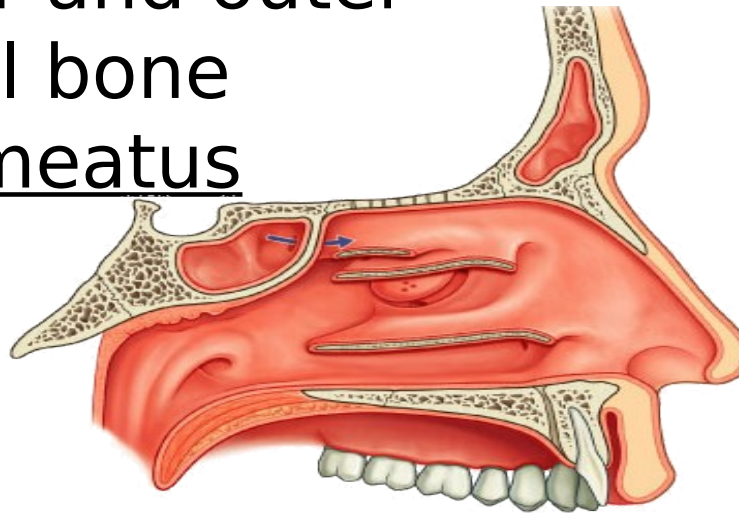


## FRONTAL SINUS

- the most superior of the sinuses.
- They are one on each side, variable in size, triangular in shape under the forehead
- lies within the inner and outer plates of the frontal bone
- drains the middle meatus

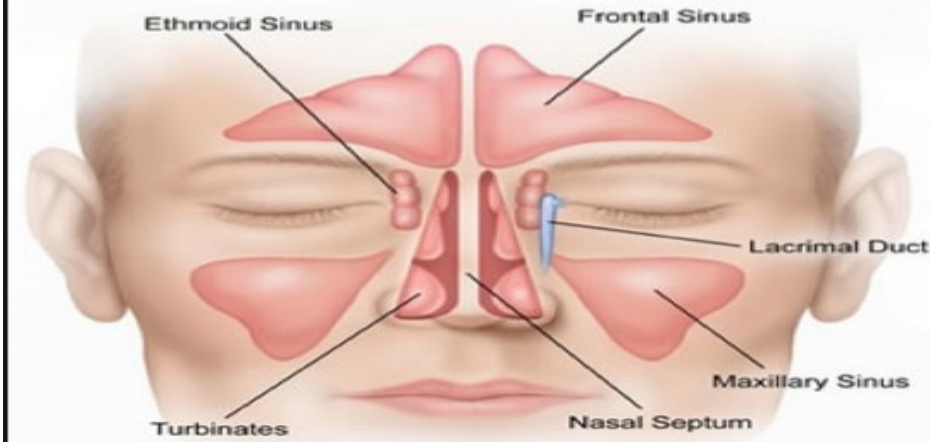


From Fehrenbach MF, Herring SW: Illustrated Anatomy of the Head and Neck, ed 3, St Louis, 2007, WB Saunders.



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Normal Sinuses, Septum and Turbinates



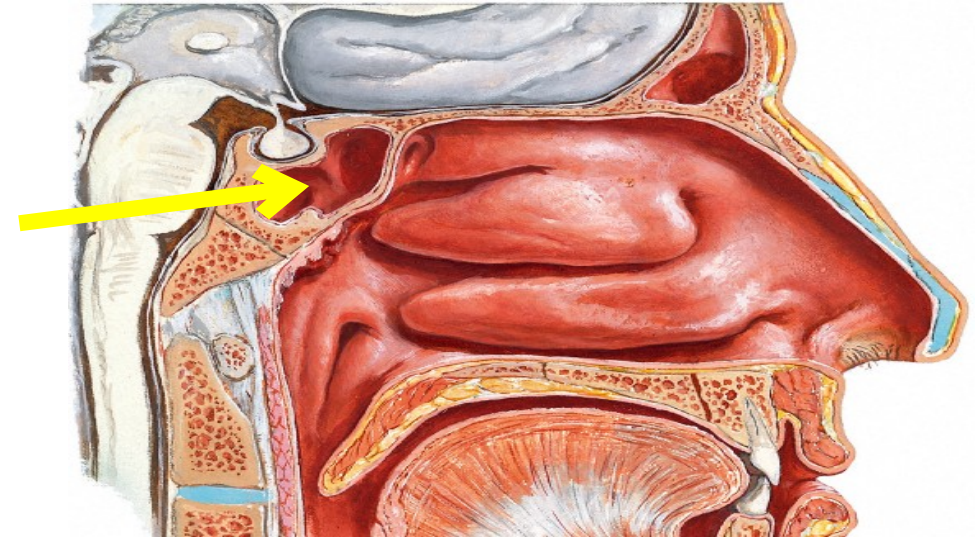
# Paranasal Air Sinuses



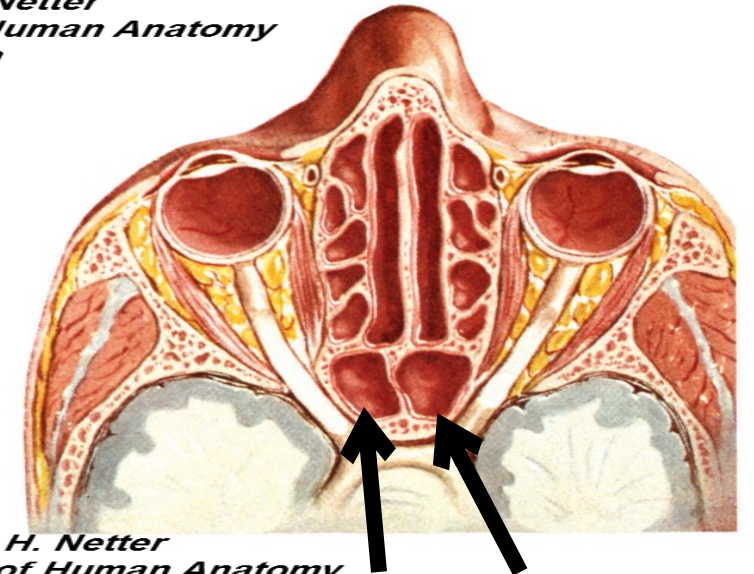
## SPHENOID SINUS

They are two (one on either side)

- within the body of the sphenoid
- open into the roof of the nasal cavity via apertures into the spheno-ethmoidal recess.
- ❑ cranial cavity,
- ❑ particularly to the pituitary gland



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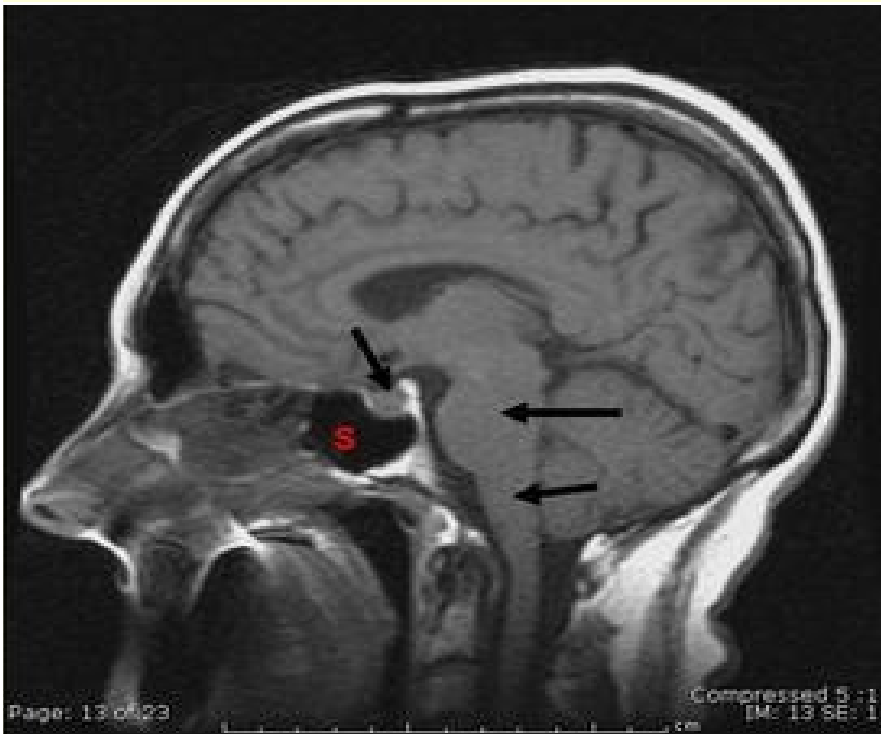


# Paranasal Air Sinuses



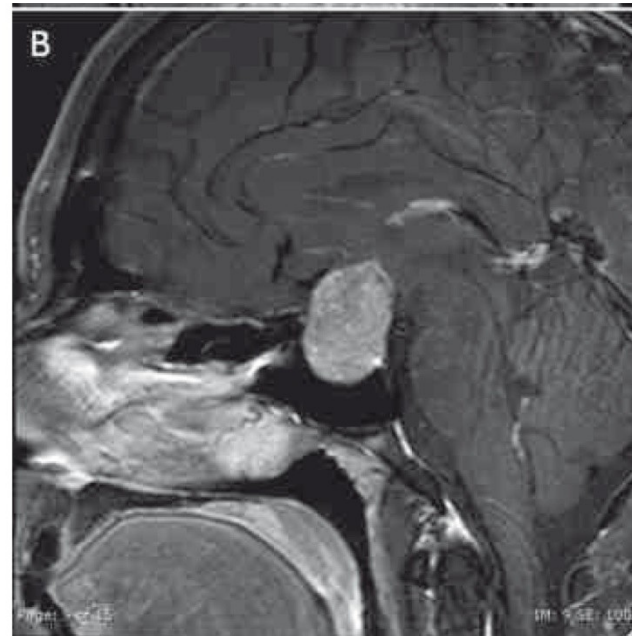
## SPHENOID SINUS

Can you identify the pituitary gland? Note its relationship to the sphenoid sinus



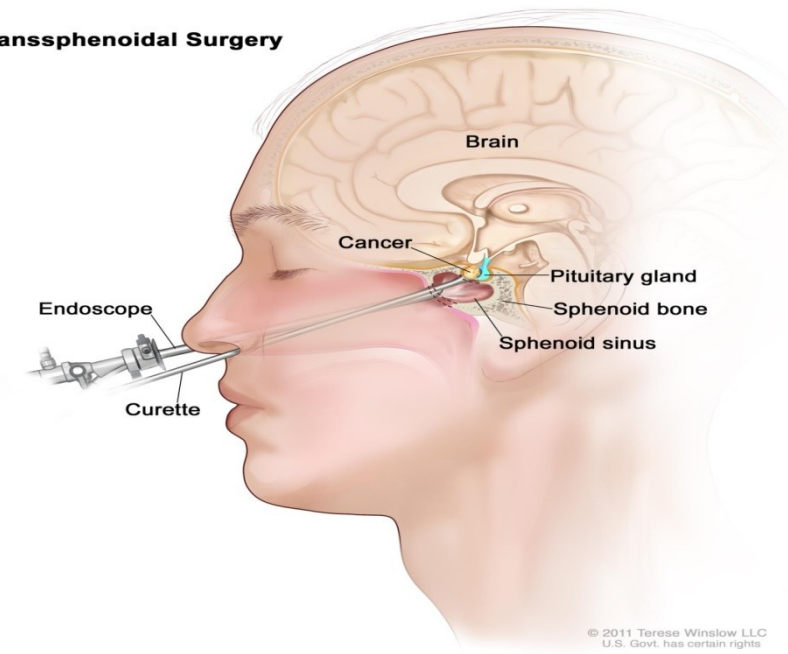
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the pituitary gland can be surgically approached through the roof of the nasal cavities by passing first through the sphenoid bone and into the sphenoidal sinuses



Cardio-pulmonary Module

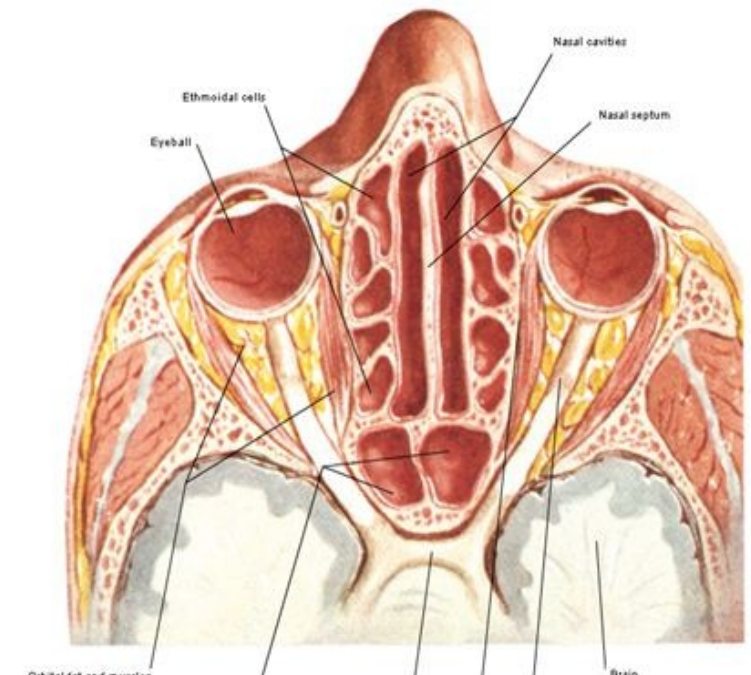
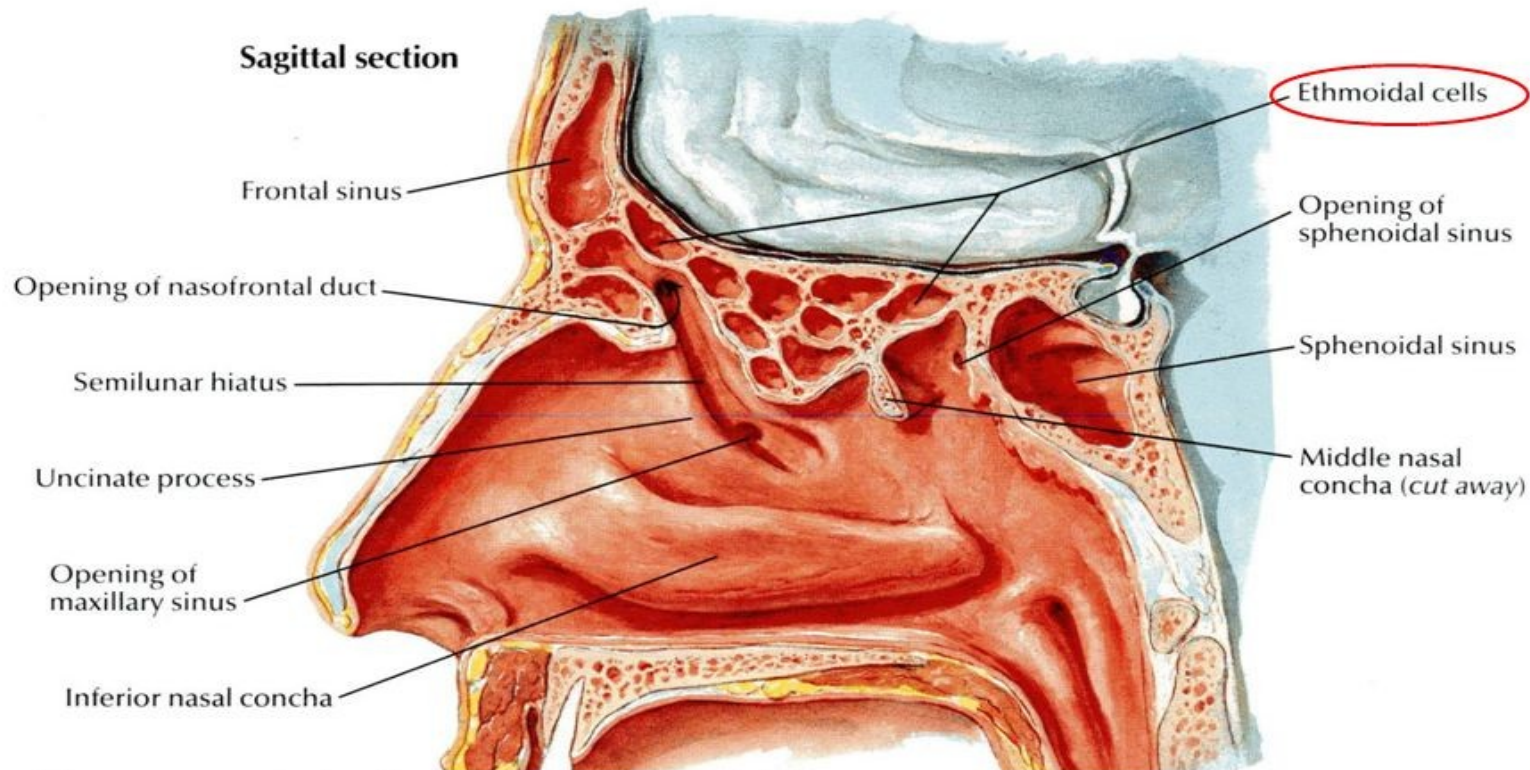
Transsphenoidal Surgery



# Paranasal Air Sinuses



## ETHMOIDAL SINUSES



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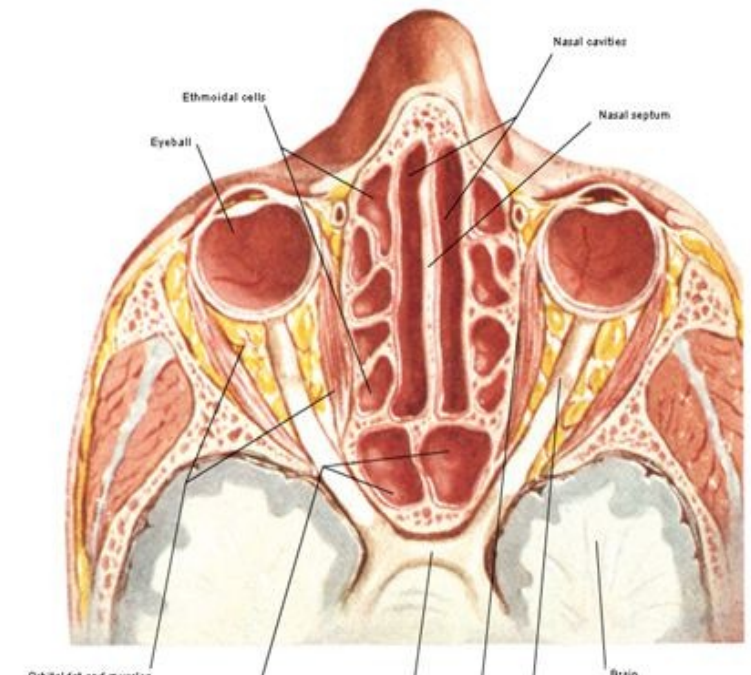
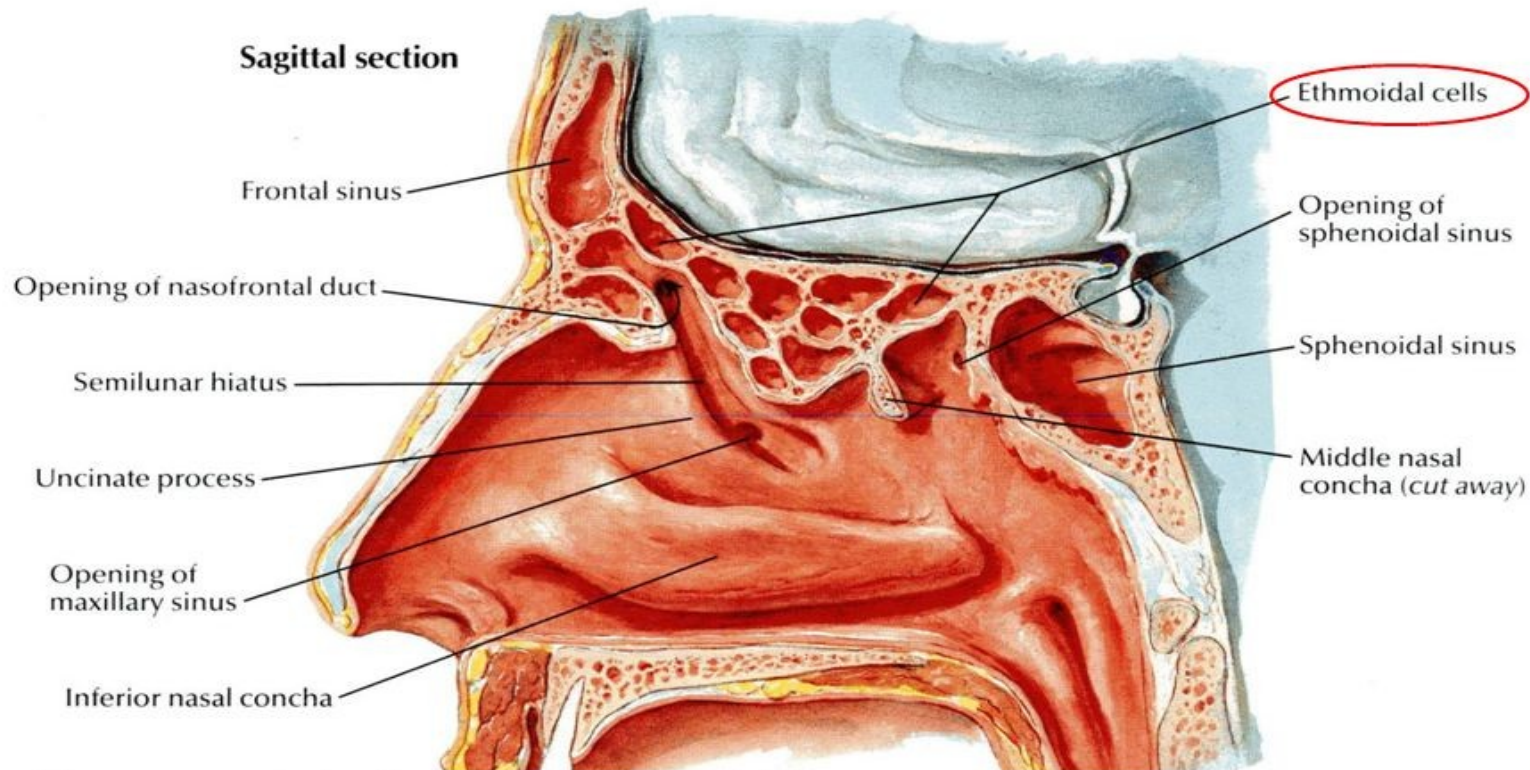
- They are contained within the **ethmoid bone**.
- Only a thin layer of bone separates these sinuses from the orbit.
- **Infection can readily spread from the ethmoidal sinuses into the orbit.**



# Paranasal Air Sinuses



## ETHMOIDAL SINUSES



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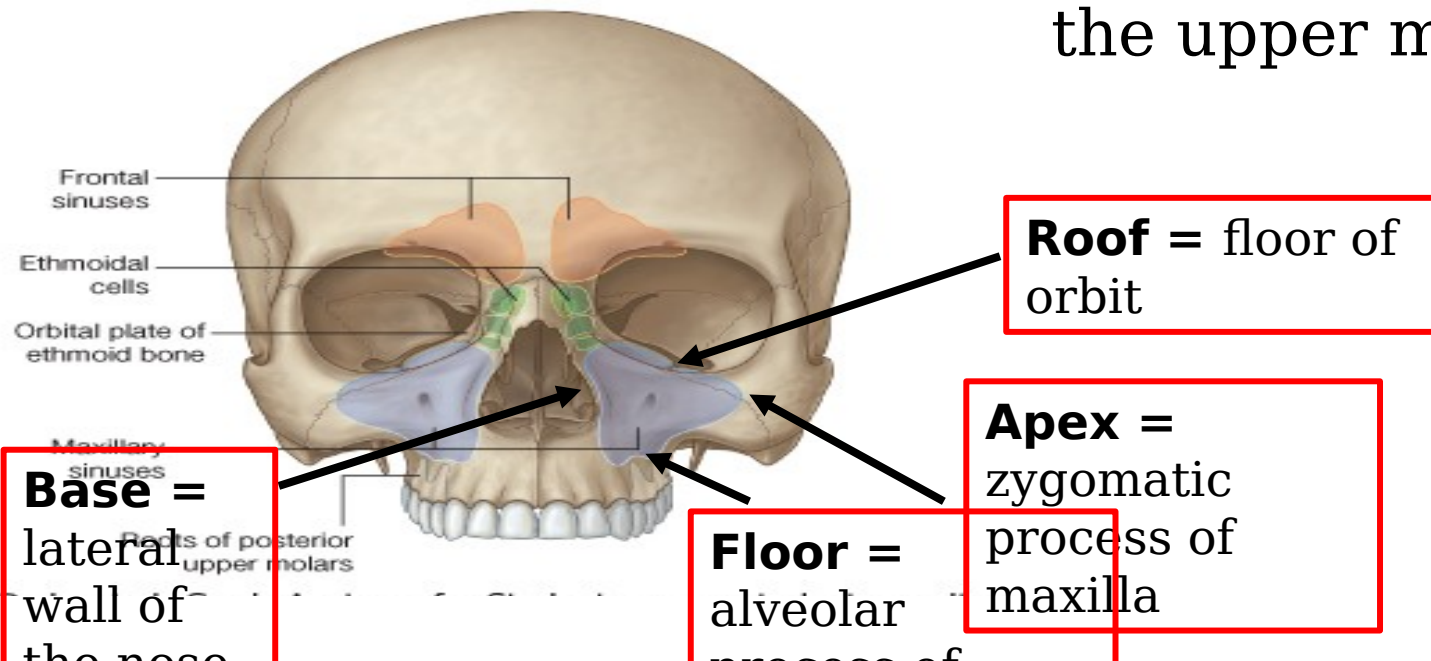
- They are contained within the **ethmoid bone**.
- Only a thin layer of bone separates these sinuses from the orbit.
- **Infection can readily spread from the ethmoidal sinuses into the orbit.**

# Paranasal Air Sinuses



## Maxillary Sinus

Each is **pyramidal** in shape; the **base** is the lateral wall of the nose, and the **apex** extends to zygomatic process of maxilla. - The **roof** is the floor of the orbit. The **floor** is the alveolar process of the upper molar teeth.



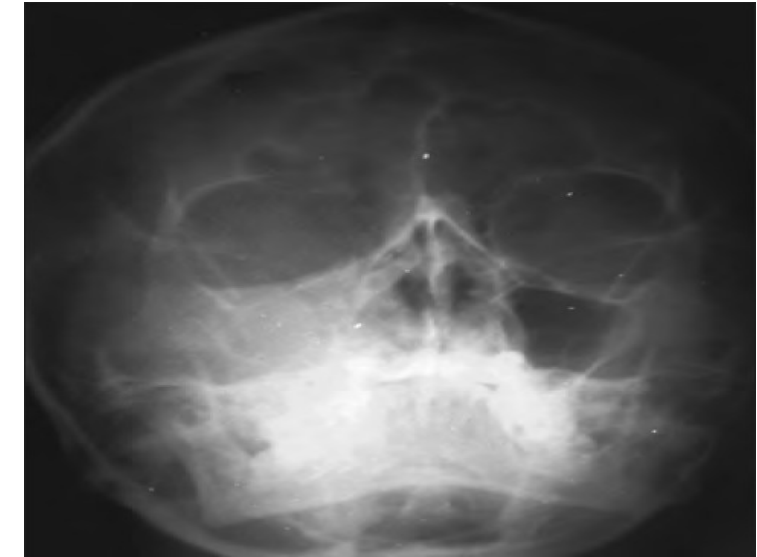
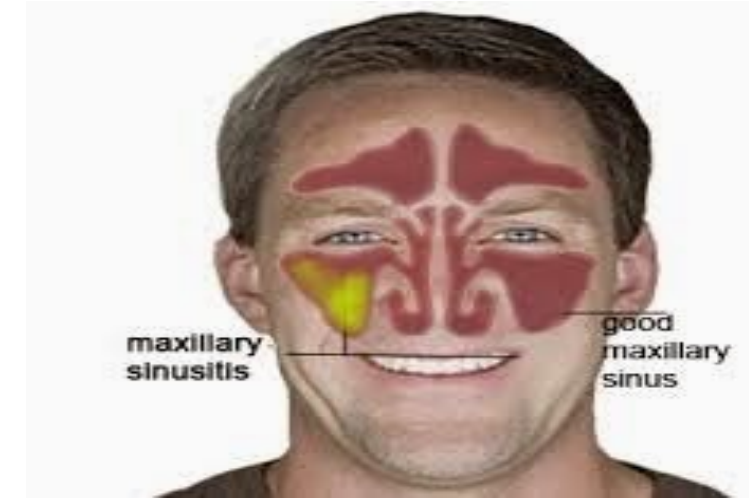
# Paranasal Air Sinuses



## Maxillary Sinus

Maxillary sinusitis is common.....why ?

- 1- difficult drainage**
- 2- closely related to teeth**
- 3- discharge from infected frontal or anterior ethmoidal sinus can spread to it**

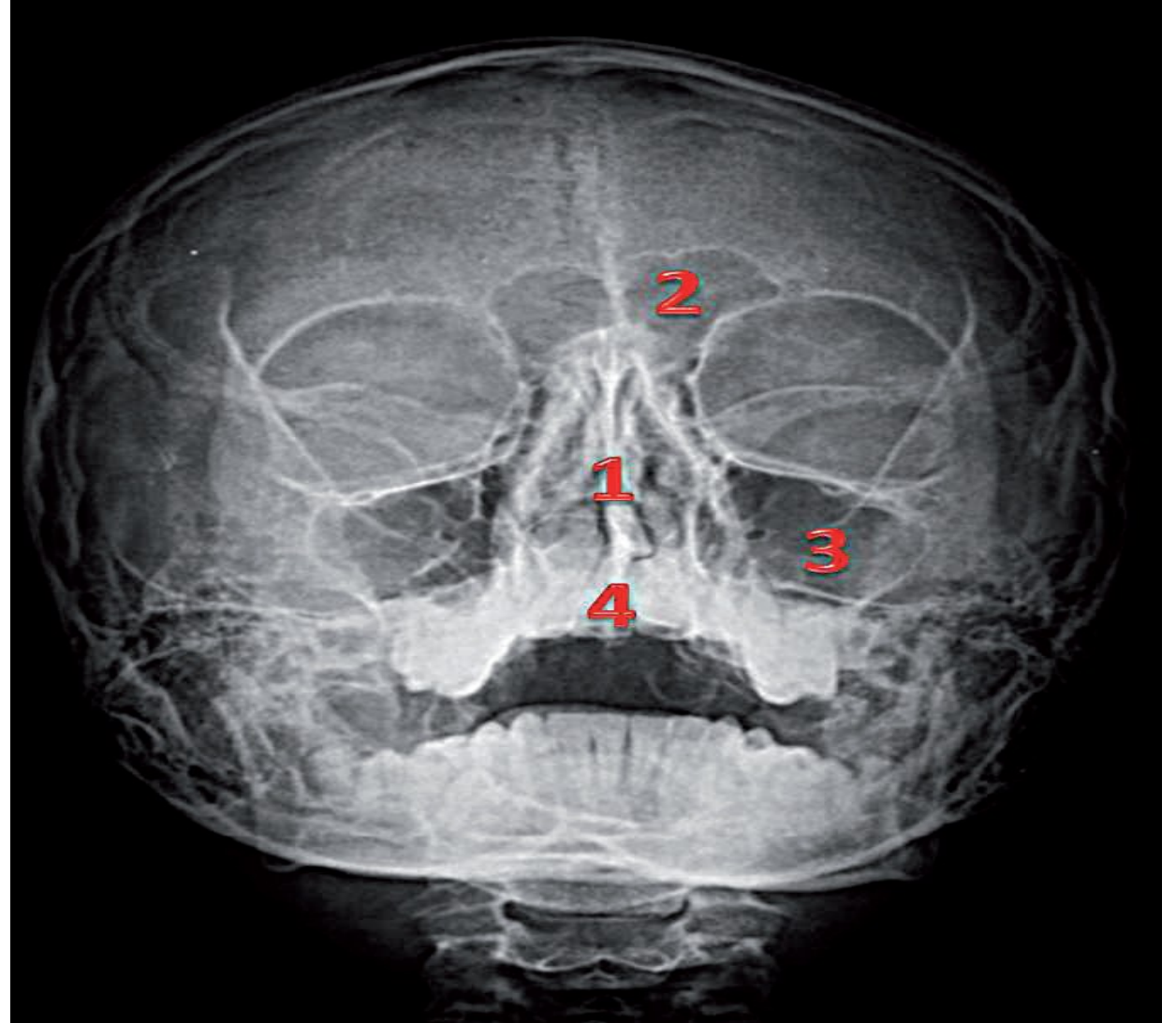




# Lecture Quiz



Identify the following structures





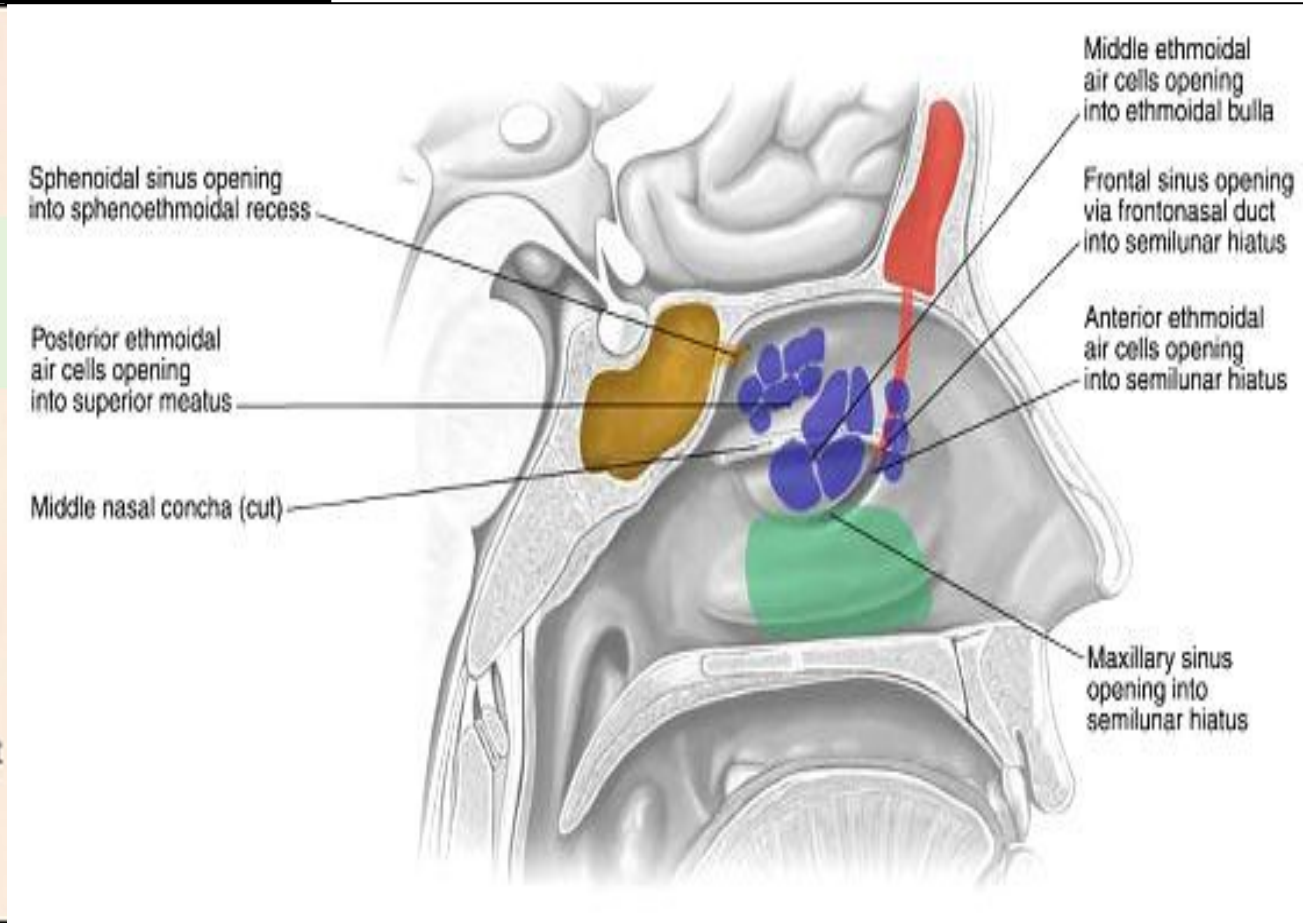
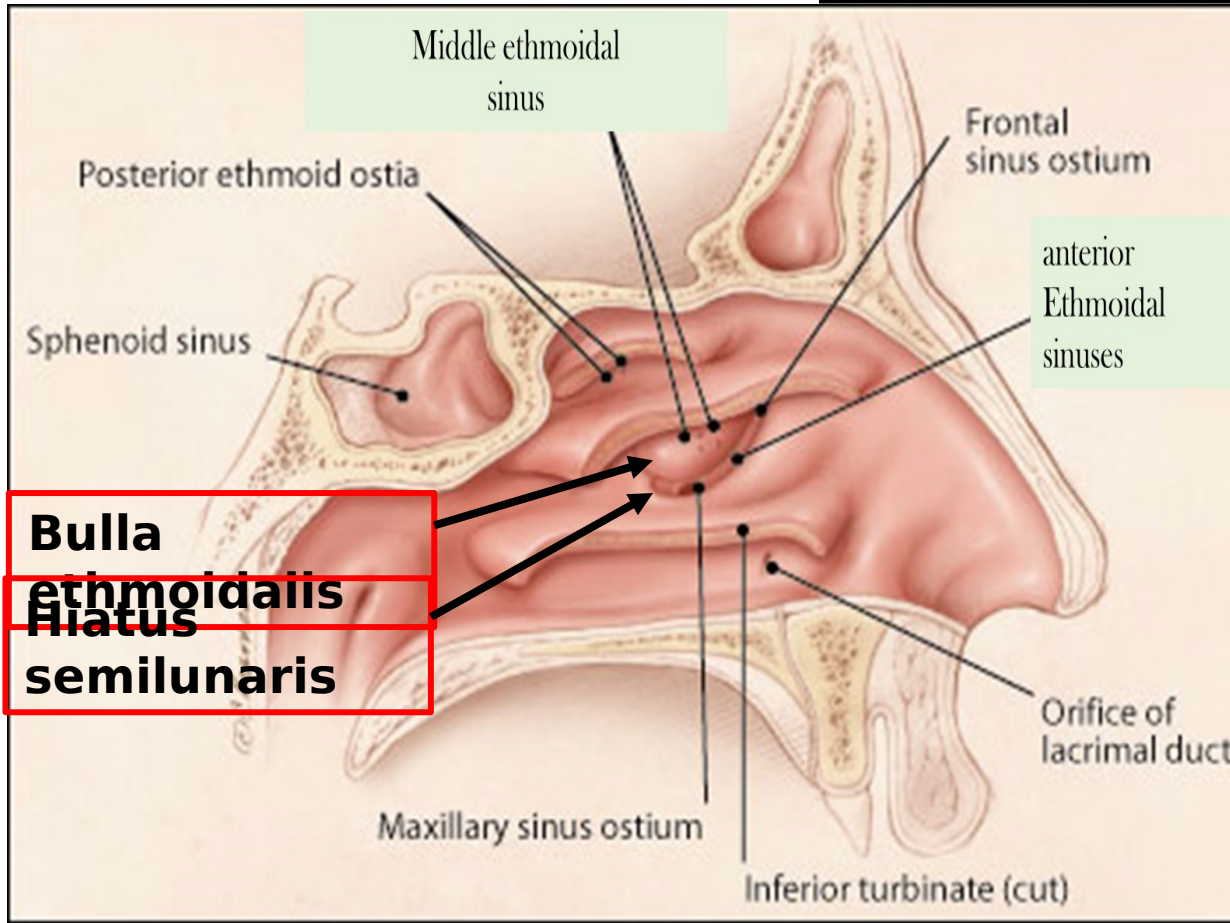
# Lecture Quiz

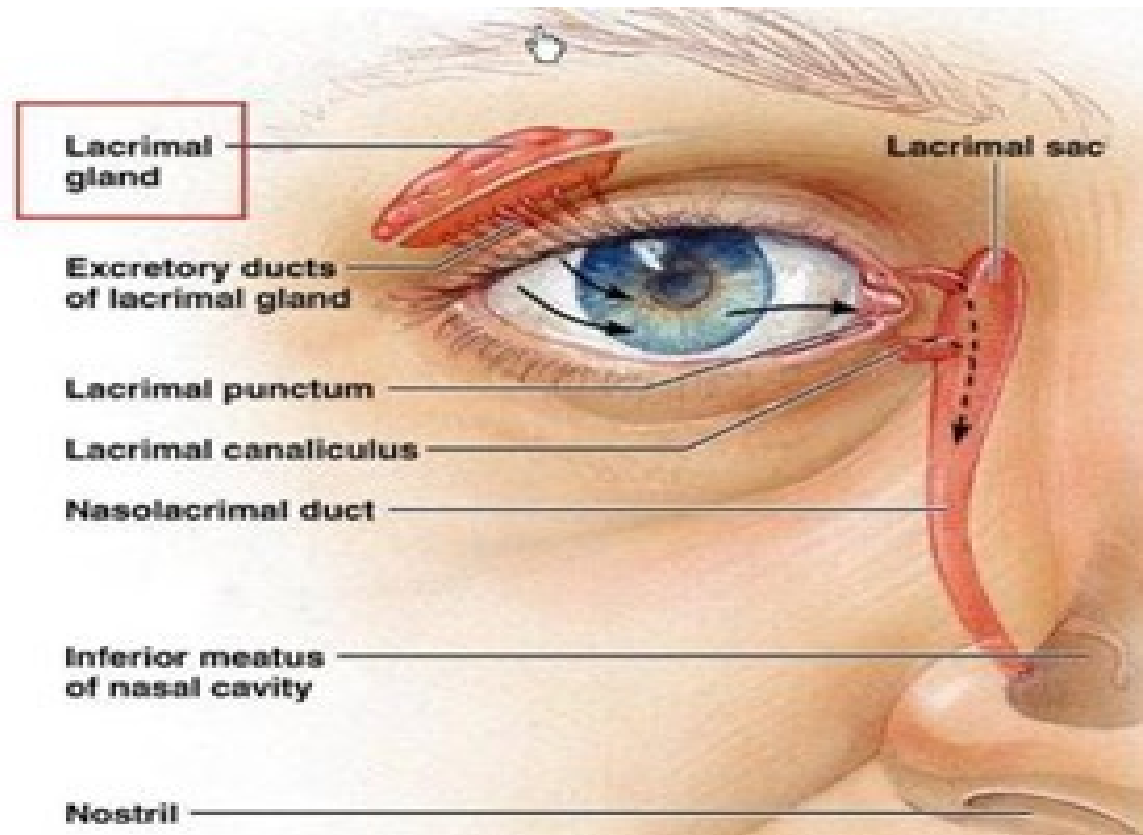


**During clinical examination of a patient with infected frontal sinus , which of the following area the doctor will palpate it for tenderness?**

- a. medial end of the superior orbital margin.
- b. below the inferior orbital margin
- c. medial wall of the orbit.
- d. lateral wall of the orbit.

# Sites of drainage of Paranasal Air Sinuses

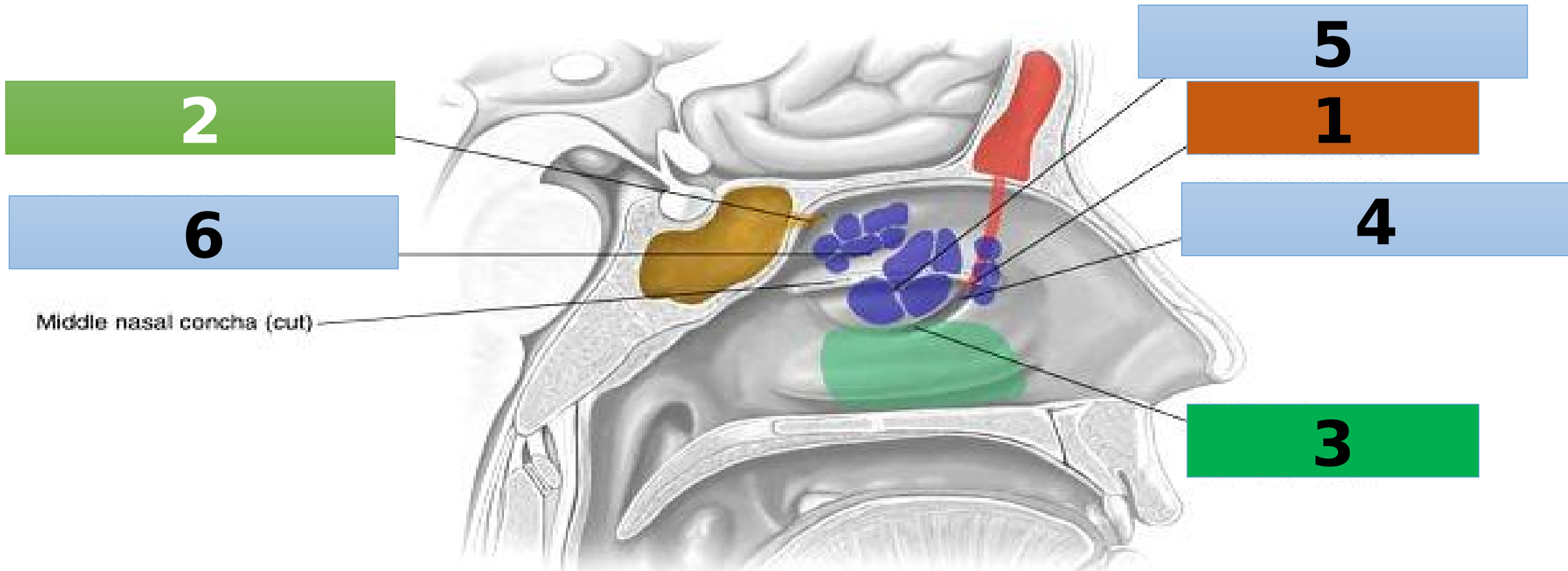




# Lecture Quiz

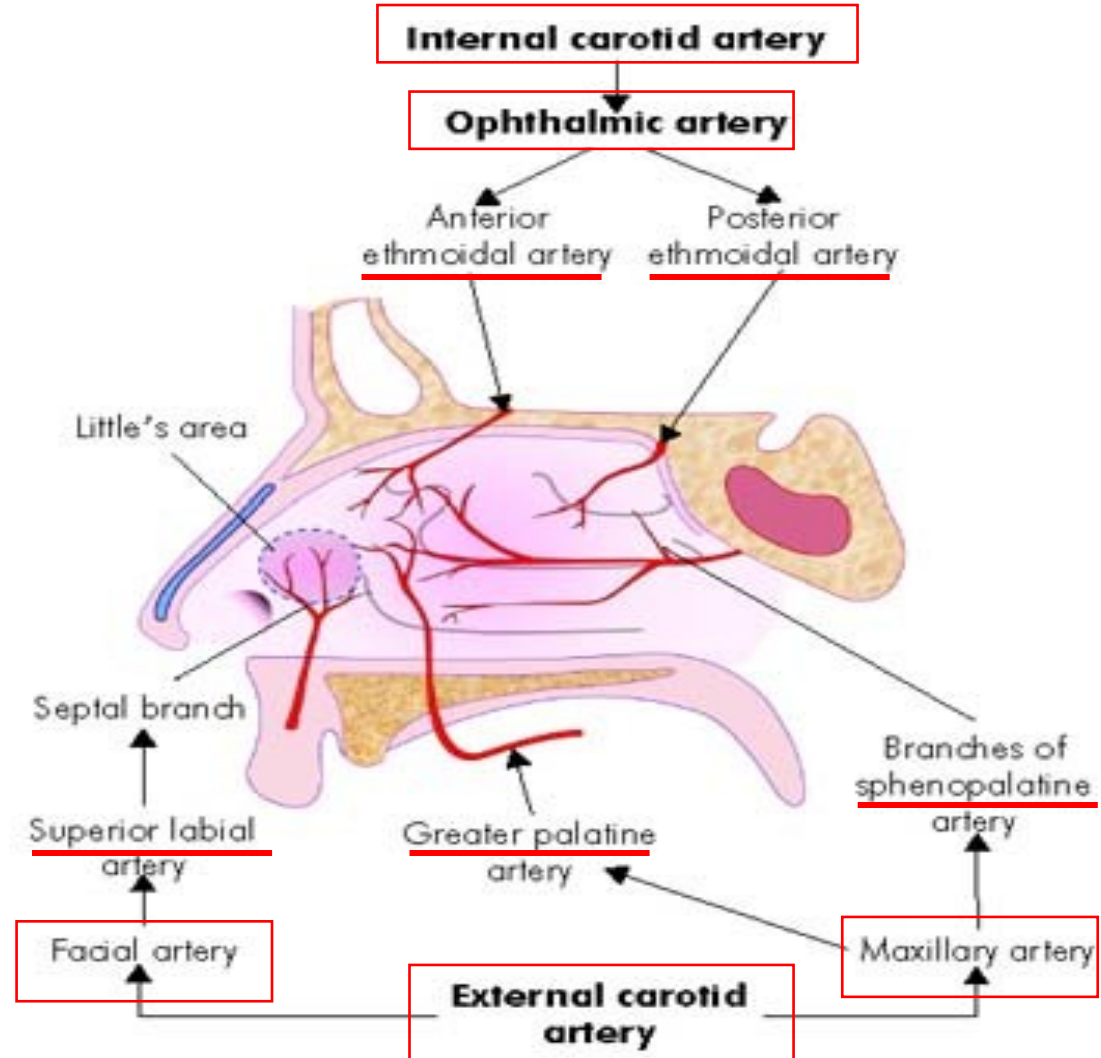


Identify the following sinuses and mention their sites for drainage

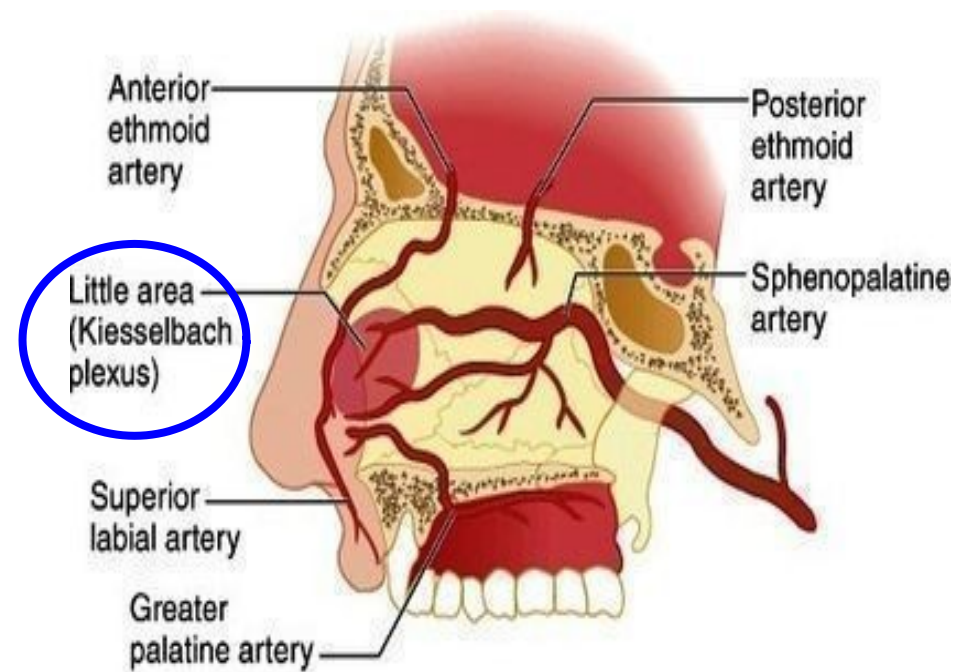




# Arteries that supply the nasal cavity



- ❑ The largest vessel supplying the nasal cavity is the **Sphenopalatine Artery**
- *Vessels that supply the nasal cavities form extensive anastomoses*
- *This is particularly evident in the **anterior region of the medial wall** = **Little's Area***
- *This area is the major*



***What is the most  
common cause of  
epistaxis ?***

# NOSE PICKING



Child sits in  
adults lap



© Kids Health Info  
RCH, Melbourne





# Lecture Quiz



*Which of the following areas is the major site of 'nose bleeding = epistaxis*

- a. anterior region of the lateral wall
- b. posterior region of the lateral wall
- c. anterior region of the medial wall
- d. posterior region of the medial wall

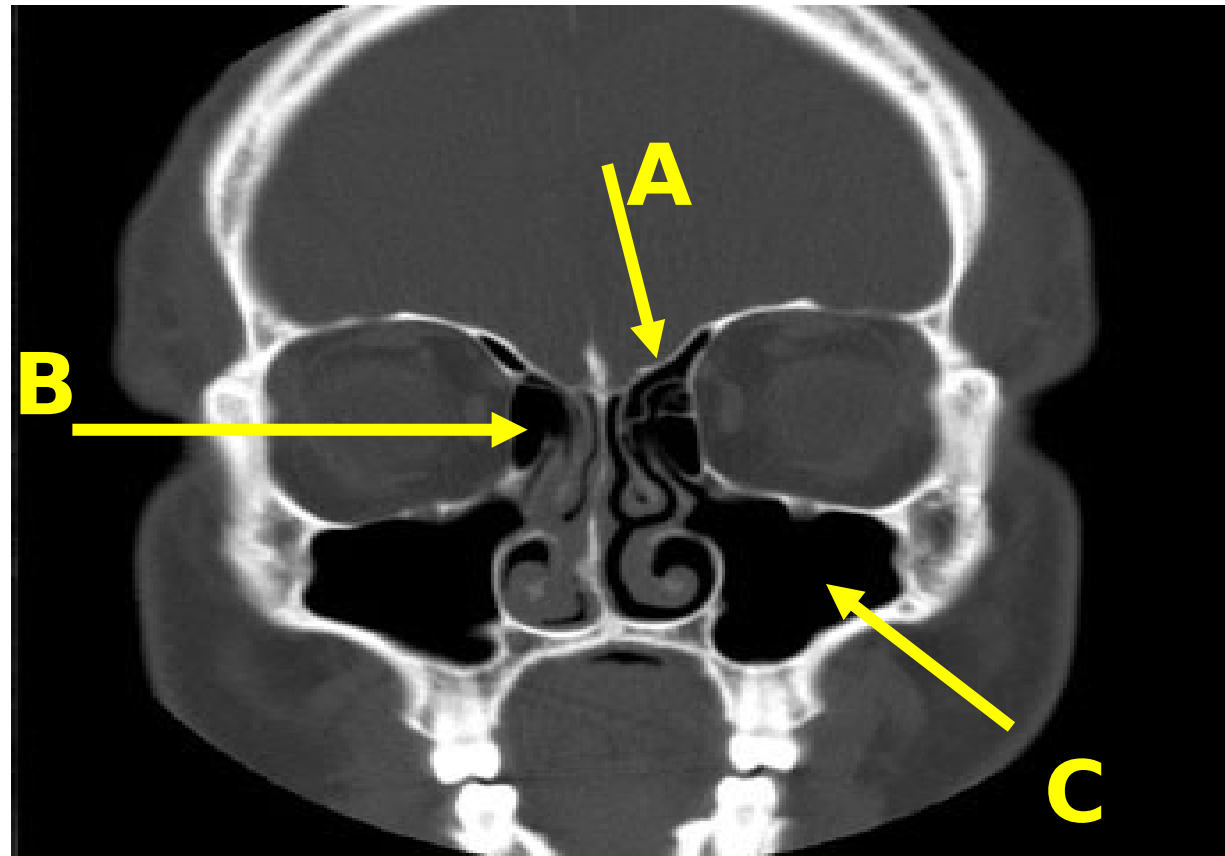
# Lecture Quiz



***Frontal***

***Ethmoidal***

***Maxillary  
sinus***



# Summary



- ☐ boundaries and wall of the nose.
- ☐ features of lateral wall of nose
- ☐ Location of the paranasal sinuses and the sites of opening of the paranasal sinuses.
- ☐ applied anatomy related to paranasal sinuses
- ☐ Arteries that supply the nasal cavity

## SUGGESTED TEXTBOOKS



*Clinical Anatomy for Medical Students .Richard S. Snell*

*Gray's anatomy for students . Page 970 -977*